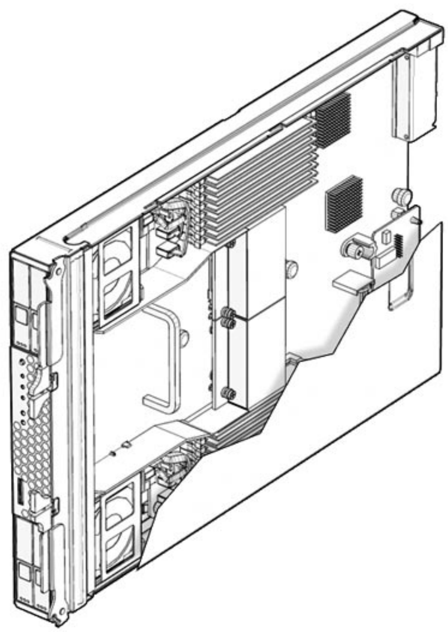
Sun Blade™ X6220 Server Module Service Manual



Sun Microsystems, Inc.
www.sun.com

Part No. 820-0046-10
March 2007, Revision A

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Contents

Preface

The *Sun Blade X6220 Server Module Service Manual* contains information and procedures for maintaining and upgrading the server modules.

Before You Read This Document

It is important that you review the safety guidelines in the *Sun Blade X6220 Server Module Safety and Compliance Guide*, 820-1706.

Product Updates

For product updates that you can download for the Sun Blade™ X6220 server modules, please visit the following Web site:

`http://www.sun.com/servers/blades/x6220/`

This site contains updates for firmware and drivers, as well as CD-ROM `.iso` images.

Related Documentation

For a description of the document set for the Sun Blade X6220 server modules, see the *Where To Find Sun Blade X6220 Server Module Documentation* sheet that is packed with your system and also is posted at the product's documentation site. See the following URL, and then navigate to your product.

http://www.sun.com/documentation

Translated versions of some of these documents are available at the product documentation site in French, Simplified Chinese, Traditional Chinese, Korean, and Japanese. English documentation is revised more frequently and might be more up-to-date than the translated documentation.

For all Sun hardware documentation, see the following URL:

http://www.sun.com/documentation

For Solaris and other software documentation, see the following URL:

http://docs.sun.com

Using UNIX Commands

This document might not contain information about basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for that information:

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at:

  http://docs.sun.com

Typographic Conventions

Typeface*	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`%` **`su`** `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

* The settings on your browser might differ from these settings.

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Sun Blade X6220 Server Module Service Manual, part number 820-0046-10

CHAPTER 1

Introduction to the Sun Blade X6220 Server Module

This chapter contains an overview of the Sun Blade X6220 server module and contains the following topics:

1.1 Features of the Server Module

The Sun Blade X6220 server module is a 1U server designed to fit into the Sun Blade 6000 chassis system. The Sun Blade X6220 server module supports two 120W Opteron Rev F processors and embedded I/O that provides PCI Express, SAS, and Gigabit Ethernet interfaces to the Sun Blade 6000 chassis midplane, and four SAS or SATA drive interfaces at the front of the server module.

Server monitoring is performed by a PowerPC based service processor (SP) module that plugs into the Sun Blade X6220 server module.

TABLE 1-1 summarizes the features of the server module.

TABLE 1-1 Summary Comparison of Features

Feature or Component	Specifications
CPU	Up to two AMD64 Opteron 200 Series dual-core processors (1 MByte L2 cache per core)
Memory	Up to eight registered ECC DDR2 DIMMs per CPU (up to 64 GB capacity using 4 GB DIMMs)
Hard disk drives (HDDs)	Four Serial-Attached SCSI (SAS) or SATA HDDs (2.5 inch or 63.5 mm)
Service processor	• MPC8248 PowerPC providing Baseboard Management Controller (BMC) functions • One 10/100 Management Ethernet Port to Midplane • Remote keyboard/video/mouse (KVMS) over IP • Integrated Light Out Manager (ILOM) management interface
RAID options	Four-channel SAS RAID disk controller
Midplane I/O	• Four 8-lane PCI Express: one per NEM and one per PCI ExpressModule (PCI EM) • Two 10/100/1000 Gigabit Ethernet, one per network express module (NEM) • 10/100 Ethernet management port to the chassis management module (CMM)
Front panel I/O	Dongle connector that interfaces to: • VGA graphics • Serial console to SP • Dual USB ports (keyboard/mouse)
Compact Flash	IDE Compact Flash Module Interface

1.2 Sun Blade X6220 Server Module Orientation

This section contains illustrations that you can use to become familiar with the components of the Sun Blade X6220 server module.

FIGURE 1-1 shows the features of the front panel.

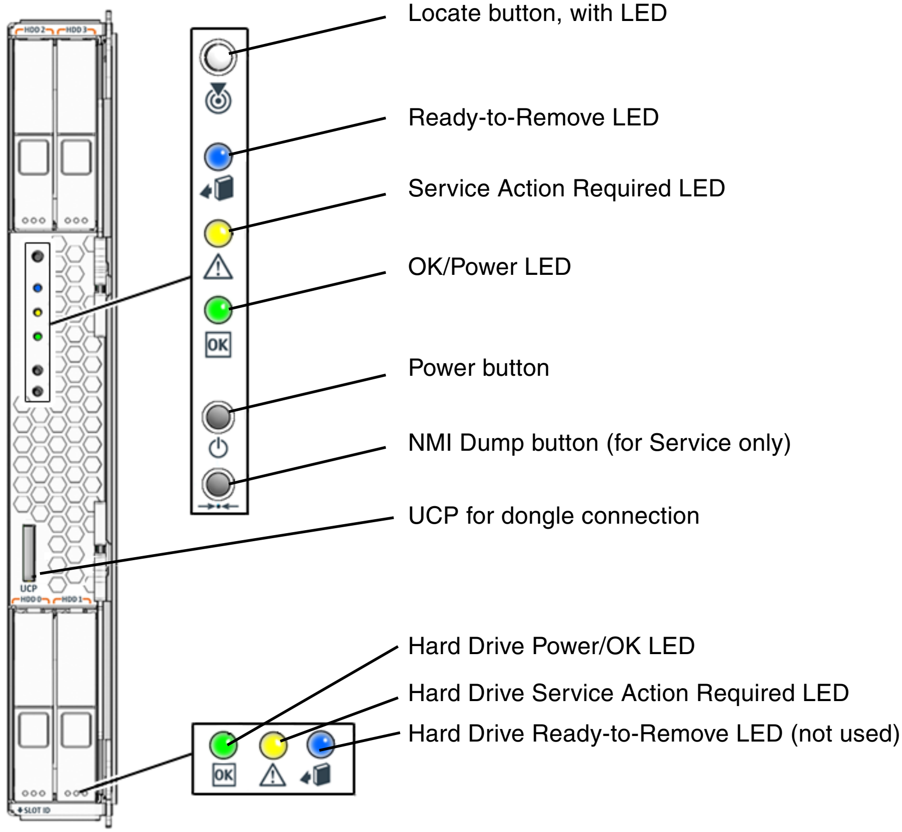


FIGURE 1-1 Sun Fire X6220 Server Module Front Panel

Caution – Do not use the NMI button unless you are instructed to do so by authorized Service personnel. The Non-Maskable Interrupt (NMI) switch sends an NMI order to the CPUs, which is used by Field Service for debugging activities at the request of Service personnel.

FIGURE 1-2 shows how to attach a dongle cable to the Sun Fire X6220 server module universal connection port (UCP). The dongle cable provides the following I/O connections for the server: VGA graphics, serial console to the server module service processor, and dual USB connectors for keyboard/mouse connections.

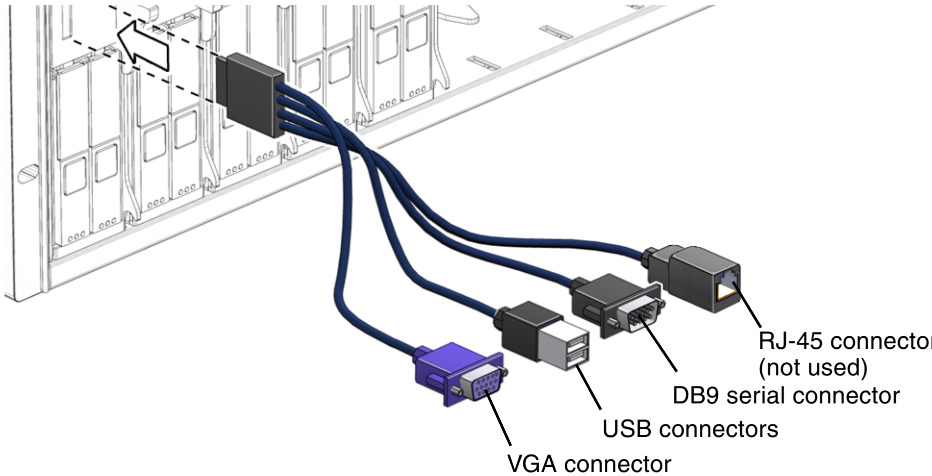


FIGURE 1-2 Attaching a Dongle Cable to the Server

Caution – If you have a dongle cable connected to a server module, make sure to remove it before closing the door of a rack cabinet. The dongle might be damaged if it is not removed before the cabinet door is closed.

FIGURE 1-3 shows the locations of the Sun Blade X6220 server module replaceable components, with the top cover removed.

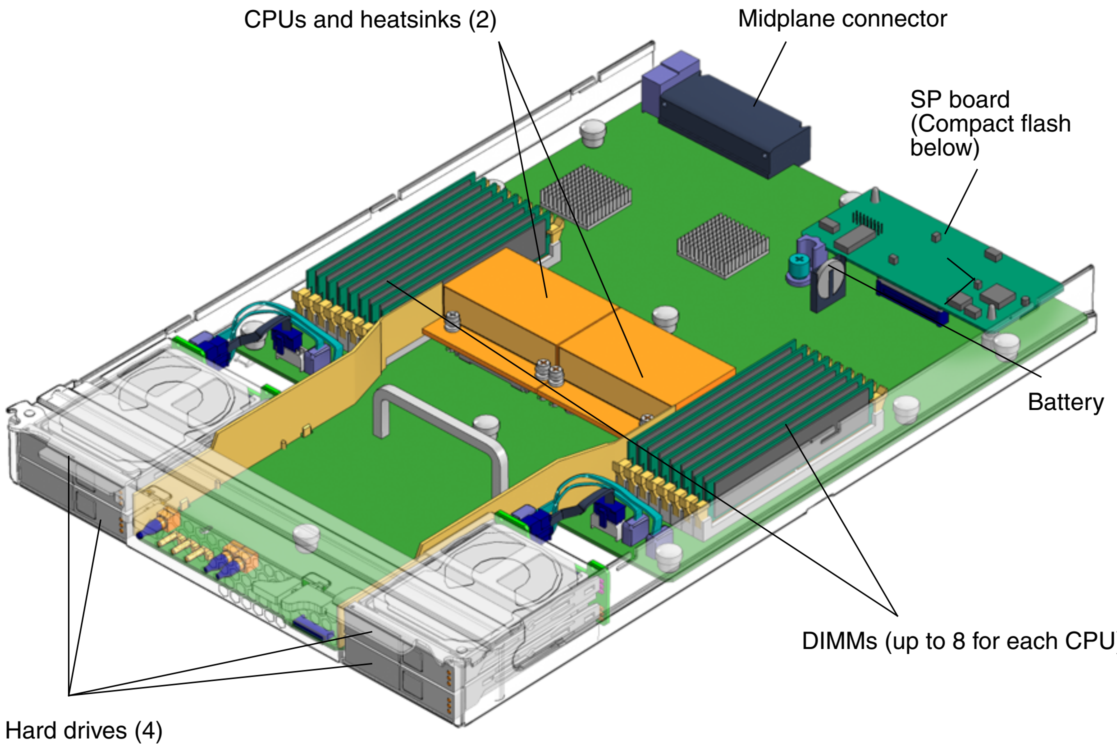


FIGURE 1-3 Sun Blade X6220 Server Module Replaceable Component Locations

1.3 Accessory Kits

TABLE 1-2 lists the contents of the accessory kit, an option that you can order with the server module.

TABLE 1-2 Accessory Kit

Item	Part Number
Sun Blade X6220 Server Module Tools and Drivers CD	707-0095
Sun Blade X6220 Server Module Bootable Diagnostics CD	705-7852
Sun Blade X6220 Server Module Sun Installation Assistant CD	707-0096
Sun N1 System Manager DVD	708-0255
Sun Blade X6220 Server Module Installation Guide (printed documentation)	820-0045
Where to Find Sun Blade X6220 Server Module Documentation (printed sheet)	820-0049
Additional safety and license documentation	

1.4 Additional Options and Replaceable Components

Supported components and their part numbers are subject to change over time. For the most up-to-date list of replaceable components for these servers, see the following URL:

`http://sunsolve.sun.com/handbook_pub/Systems/`

1. Click the name and model of your server.
2. On the product page that opens for the server, click `Full Components List` for the list of components.

Note – These servers are fully compliant with the Reduction of Hazardous Substances (RoHS) Directive.

CHAPTER 2

Powering On and Configuring BIOS Settings

The following topics are contained in this chapter:

2.1 Powering On the Server

Note – Before powering on your server for the first time, follow the installation instructions provided in the *Sun Blade X6220 Server Module Installation Guide*, 820-0044.

---

1. **Verify that power cords have been connected to the chassis power supplies and that standby power is on.**

   In standby power mode, the Power/OK LED on the front panel flashes, indicating that the service processor is working and that the system is ready to be fully powered on to main power mode. See FIGURE 2-1 for the LED location.

2. **Use a stylus, or other pointed object, to press and release the recessed Power button on the front panel of the server.** See FIGURE 2-1 for the Power button location.

   When the main power is applied to the full server, the Power/OK LED next to the Power button lights and remains lit.

FIGURE 2-1 shows the location of the power button.

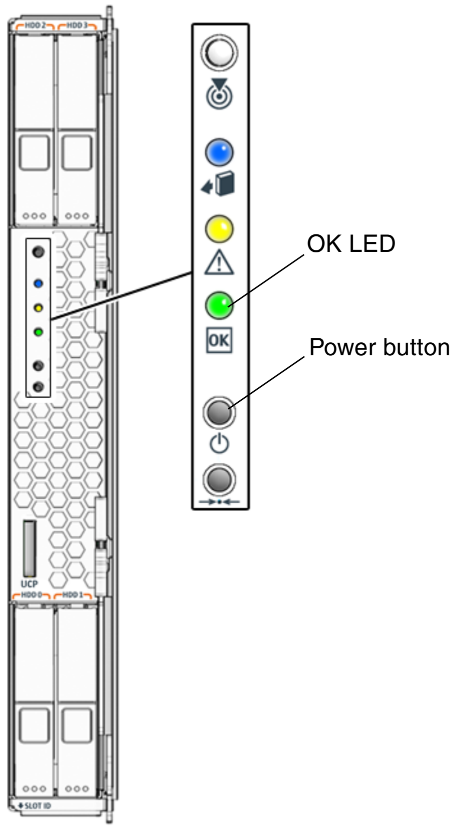


FIGURE 2-1 Power Button and Power/OK LED Location

2.2 Powering Off the Server

1. **Choose a method for shutting down the server from main power mode to standby power mode.**
   - **Graceful shutdown:** Use a stylus, or other pointed object, to press and release the Power button on the front panel. This causes Advanced Configuration and Power Interface (ACPI) enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems will shut down to standby power mode immediately.
   - **Emergency shutdown:** Press and hold the Power button for four seconds to force the main power off and enter standby power mode.
   - **ILOM CLI shutdown:** Log in to the SP ILOM CLI and type:

     ```
     stop /SYS
     ```
   - **ILOM WebGUI shutdown:** Log in to the ILOM WebGUI and do the following:

   a. **Select Remote Control => Remote Power Control.**

      The Server Power Control page appears.

   b. **Select an action from the drop-down list.**
      - Immediate Power Off - Select to power off the server.
      - Graceful Shutdown and Power Off - Select to gracefully shut down the system operating system before the system is powered off.

      Refer to the *Integrated Lights Out Manager Administration Guide for ILOM 1.1.1*, 820-0280, for more information

   When the main power is off, the Power/OK LED on the front panel begins flashing, indicating that the server is in standby power mode, and the blue Ready-to-Remove light turns on.

2. **To completely power off the server, remove the server module from the chassis.**

   See Section 4.2, "Removing the Server Module From the Chassis and Removing the Cover" on page 4-2.

2.3 Configuring BIOS Settings

This section describes how to view and modify the BIOS settings.

The basic input/output system (BIOS) has a setup utility stored in the BIOS flash memory. The setup utility reports system information and can be used to configure the BIOS settings. The configured data is provided with context-sensitive help and is stored in the system's battery-backed CMOS RAM. If the configuration stored in the CMOS RAM is invalid, the BIOS settings default to optimal values specified in the BIOS.

The BIOS setup utility contains seven menu screens, which are displayed in this order: Main, Advanced, PCI/PnP, Boot, Security, Chipset, and Exit.

Use the left and right arrow keys to move sequentially back and forth through the seven screens. Fields that can be reconfigured are displayed in color. All other fields are nonconfigurable. Use the up and down arrows, on the keyboard, to scroll through a screen's menu. Use the Tab key to move back and forth across columns.

2.3.1 Changing the Configuration of a BIOS Menu Item

You can change the BIOS configuration using several different interfaces:

- Use a USB keyboard and mouse, and a VGA monitor connected directly to the server dongle.
- Use the remote video console of the ILOM service processor and redirect the server’s console output. Refer to the *Integrated Lights Out Manager Administration Guide for ILOM 1.1.1*, 820-0280, for more information.
- Use a terminal (or terminal emulator connected to a computer) through the serial port on the server dongle.

1. **To change the system parameters, enter the BIOS setup utility by pressing the F2 key while the system is performing the power-on self-test (POST).**

   POST testing is indicated when the Power/OK LED on the front panel of the server module goes into slow-blink mode.

2. **Highlight the field to be modified using the arrow and Tab keys.**

3. **Press Enter to select the field.**

   A dialog box appears. The box presents you with the options available for the setup field that you have chosen.

4. **Modify the setup field and close the screen.**

5. **If you need to modify other setup parameters, use the arrow and Tab keys to navigate to the desired screen and menu item, and then repeat Steps 1 through 3. Otherwise, go to Step 5.**

6. **Press and release the right arrow key until the Exit menu screen is displayed.**

7. **Follow the instructions on the Exit menu screen to save your changes and exit the Setup utility.**

2.3.2 BIOS Considerations

This section contains information and considerations regarding the system BIOS.

2.3.2.1 PCI Card Slot Booting Priority

The Sun Blade X6220 server modules have up to two PCI ExpressModules (PCI EMs) per blade installed in the chassis.

The slots for the PCI ExpressModules are detected by the BIOS during startup in this order: PCI EM BLx.1 and PCI EM BLx.0. For example, if the server module is in slot 3, the BIOS boot priority is 3.0, 3.1.

See the chassis documentation for further information on PCI EMs.

2.3.2.2 Ethernet Port Device and Driver Naming

The Sun Blade X6220 server modules have up to two 10/100/1000BASE-T Gigabit Ethernet ports provided by the NEMs installed in the chassis. The lower NEM port is NET 0 and the upper NEM port is NET 1, as shown in FIGURE 2-2.

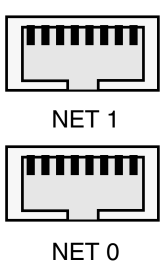


FIGURE 2-2 Ethernet Port Chassis Labeling Designations

See the chassis documentation for further information on NEMs.

The device naming for the Ethernet interfaces is reported differently by different interfaces and operating systems. Refer to FIGURE 2-3 for a diagram that explains how various operating systems and interfaces name the two Ethernet ports shown in FIGURE 2-2.

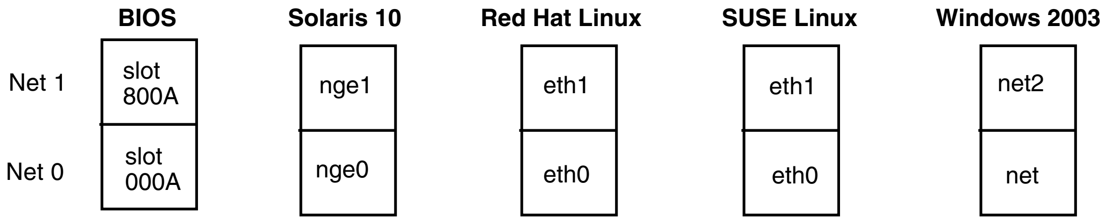


FIGURE 2-3 Sun Blade X6220 Server Module Ethernet Port Naming

2.3.2.3 Ethernet Port Booting Priority

The order in which the BIOS detects the Ethernet ports during bootup, and the corresponding drivers that control those ports, are listed below:

1. NET 0 (NVIDIA NIC 0)
2. NET 1 (NVIDIA NIC 1)

2.3.2.4 BIOS Option ROM Size Limitation

The BIOS Option ROM is 128 KB. Of these 128 KB, approximately 80 KB are used by the VGA controller, the LSI controller, and the network interface card. Approximately 48 KB remain for the Option ROM.

2.3.3 BIOS Setup Screens

TABLE 2-1 contains summary descriptions of the seven top-level BIOS setup screens and indicates the section that contains examples of the BIOS screens.

TABLE 2-1 BIOS Setup Screens Summary

Screen	Description	Section
Main	General system information.	"BIOS Main Menu Screen" on page 2-10
Advanced	Configuration interface for the CPUs, IDE, SuperIO, ACPI, Event Log, HyperTransport, IPMI, MPS, PCI Express, PowerNow!, Remote Access, and USB.	"BIOS Advanced Menu Screens" on page 2-10
PCI/PnP	Plug-and-Play (PnP) devices can be configured by the BIOS (default), or by the operating system (if applicable).	"BIOS PCI/PnP Menu Screen" on page 2-19
Boot	Configure the boot device priority (CD/DVD, Removables, Hard Disks, Networks).	"BIOS Boot Menu Screens" on page 2-20
Security	Install or change the user and supervisor passwords.	"BIOS Security Settings Menu" on page 2-23
Chipset	Configuration options for the NorthBridge and SouthBridge devices. Note that the Memory Chipkill option is enabled by default. Enabling Chipkill improves system reliability but degrades system performance under specific applications.	"BIOS Chipset Menu Screens" on page 2-23
Exit	Save or discard changes.	"BIOS Exit Option Menu Screen" on page 2-26

FIGURE 2-4 summarizes the BIOS Configuration Utility menu tree, with differences between models of the server noted. See the following sections for examples of each of these screens.

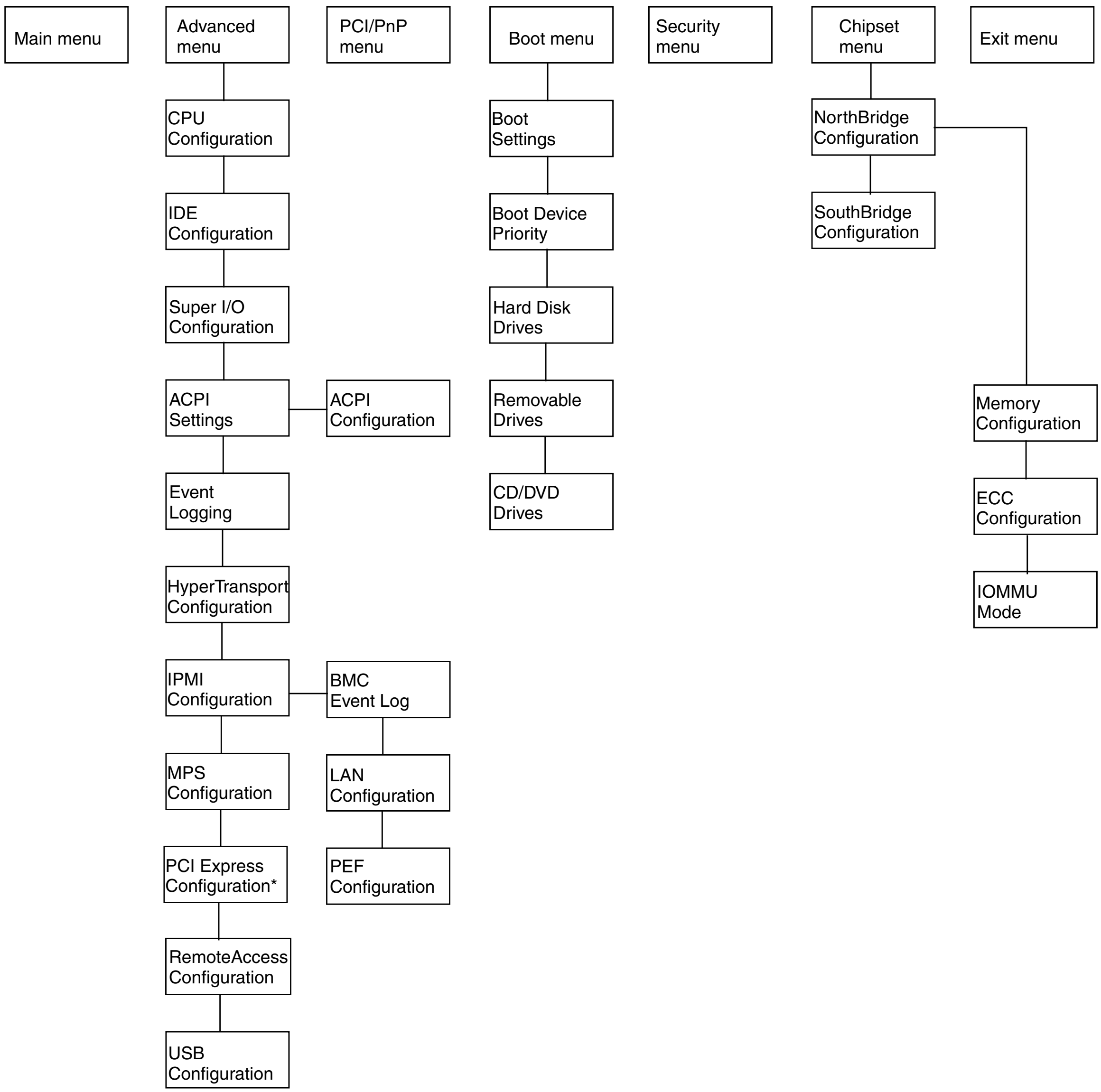


FIGURE 2-4 Sun Blade X6220 Server Module BIOS Configuration Utility Menu Tree

The following figures show sample BIOS setup menu screens and show optional default settings.

Note – The screens shown are examples. The version numbers and the screen items and selections shown are subject to change over the life of the product.

2.3.4 BIOS Main Menu Screen

```
Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
********************************************************************************
* System Overview                                    ** Use [ENTER], [TAB]     *
* **************************************************** or [SHIFT-TAB] to      *
* AMIBIOS                                            ** select a field.        *
* Version   : 08.00.12                               **                        *
* Build Date: 02/07/07                               ** Use [+] or [-] to      *
* ID        :0ABJT023                                ** configure system Time. *
*                                                    **                        *
* Product Name        :Sun Blade X6220 Server Module **                        *
* System Serial Number   : 1005:CB-065026007C        **                        *
* BMC Firmware Revision : 1.01.01                    **                        *
*                                                    **                        *
* Processor                                          **                        *
* Type      : AMD Opteron(tm) Processor 2220         ** **     Select Screen   *
* Speed     : 2800 MHz                               ** **     Select Item     *
* Count     : 4                                      ** +-     Change Field    *
*                                                    ** Tab    Select Field    *
* System Memory                                      ** F1     General Help    *
* Size      : 3.5 GB                                 ** F10    Save and Exit   *
*                                                    ** ESC    Exit            *
********************************************************************************
```

2.3.5 BIOS Advanced Menu Screens

2.3.5.1 BIOS Advanced Menu Main Screen

```
Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
********************************************************************************
* Advanced Settings                                    * Options for CPU        *
* **************************************************** *                        *
* WARNING: Setting wrong values in below sections      *                        *
*          may cause system to malfunction.            *                        *
* * CPU Configuration                                  *                        *
* * IDE Configuration                                  *                        *
* * SuperIO Configuration                              *                        *
* * ACPI Configuration                                 *                        *
* * Hyper Transport Configuration                      *                        *
* * Event Log Configuration                            *                        *
* * IPMI 2.0 Configuration                             *                        *
* * MPS Configuration                                  * **    Select Screen    *
* * PCI Express Configuration                          * **    Select Item      *
* * Remote Access Configuration                        * Enter Go to Sub Screen *
* * USB Configuration                                  * F1    General Help     *
*                                                      * F10   Save and Exit    *
*                                                      * ESC   Exit             *
********************************************************************************
```

2.3.5.2 BIOS Advanced Menu CPU Configuration Screen

```
          Advanced
********************************************************************************
* CPU Configuration                                    * This option should     *
* Module Version: 13.06                                * remain disabled for    *
* Physical Count: 2                                    * the normal operation.  *
* Logical Count : 4                                    * The driver developer   *
* **************************************************** * may enable it for     *
* AMD Opteron(tm) Processor 2220                       * testing purpose.       *
* Revision: F3                                         *                        *
* Cache L1: 128KB                                      *                        *
* Cache L2: 2048KB                                     *                        *
* Speed   : 2800MHz                                    *                        *
* Current FSB Multiplier: 14x                          *                        *
* Maximum FSB Multiplier: 14x                          *                        *
* Able to Change Freq.   : Yes                         * **    Select Screen    *
* uCode Patch Level      : None Required               * **    Select Item      *
*                                                      * +-    Change Option    *
* GART Error Reporting            [Disabled]           * F1    General Help     *
* Microcode Update                [Enabled]            * F10   Save and Exit    *
* SUM                             [Enabled]            * ESC   Exit             *
* CPU Overclock in MHz            [200]                *                        *
* Runtime Legacy PSB              [Disabled]           *                        *
********************************************************************************
```

2.3.5.3 BIOS Advanced Menu IDE Configuration Screen

```
         Advanced
********************************************************************************
* IDE Configuration                                      * DISABLED: disables the *
* ****************************************************** * integrated IDE         *
* OnBoard PCI IDE Controller      [Primary]              * Controller.            *
*                                                        * PRIMARY: enables only  *
* * Primary IDE Master               : [Not Detected]    * the Primary IDE        *
* * Primary IDE Slave                : [Not Detected]    * Controller.            *
*                                                        * SECONDARY: enables     *
* Hard Disk Write Protect         [Disabled]             * only the Secondary IDE *
* IDE Detect Time Out (Sec)       [35]                   * Controller.            *
* ATA(PI) 80Pin Cable Detection   [Host & Device]        * BOTH: enables both IDE *
* SATA0 IDE Interface             [Disabled]             * Controllers.           *
* SATA1 IDE Interface             [Disabled]             *                        *
* I04 SATA0 IDE Interface         [Disabled]             * **    Select Screen    *
* I04 SATA1 IDE Interface         [Disabled]             * **    Select Item      *
* First Boot Device from          [P-ATA]                * +-    Change Option    *
*                                                        * F1    General Help     *
*                                                        * F10   Save and Exit    *
*                                                        * ESC   Exit             *
*                                                        *                        *
*                                                        *                        *
********************************************************************************
```

2.3.5.4 BIOS Advanced Menu SuperIO Chipset Configuration Screen

```
         Advanced
********************************************************************************
* Configure Smc27X Super IO Chipset                      * Allows BIOS to Select  *
* ****************************************************** * Serial Port1 Base      *
* Serial Port0 Address            [3F8/IRQ4]             * Addresses.             *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        * **    Select Screen    *
*                                                        * **    Select Item      *
*                                                        * +-    Change Option    *
*                                                        * F1    General Help     *
*                                                        * F10   Save and Exit    *
*                                                        * ESC   Exit             *
*                                                        *                        *
*                                                        *                        *
********************************************************************************
```

2.3.5.5 BIOS Advanced Menu ACPI Settings Screen

```
          Advanced
********************************************************************************
* ACPI Settings                                        * Yes / No              *
* **************************************************** * ACPI support for      *
* ACPI Aware O/S                 [Yes]                 * Operating System.     *
*                                                      *                       *
* * Advanced ACPI Configuration                        * Yes: If OS            *
*                                                      * supports ACPI.        *
*                                                      *                       *
*                                                      * No: If OS             *
*                                                      * does not support      *
*                                                      * ACPI.                 *
*                                                      *                       *
*                                                      *                       *
*                                                      * **    Select Screen   *
*                                                      * **    Select Item     *
*                                                      * +-    Change Option   *
*                                                      * F1    General Help    *
*                                                      * F10   Save and Exit   *
*                                                      * ESC   Exit            *
*                                                      *                       *
*                                                      *                       *
********************************************************************************
```

2.3.5.6 BIOS Advanced Menu ACPI Configuration Screen

```
          Advanced
********************************************************************************
* Advanced ACPI Configuration                          * Enable RSDP pointers  *
* **************************************************** * to 64-bit Fixed System *
* ACPI 2.0 Features              [Yes]                 * Description Tables.   *
* ACPI APIC support              [Enabled]             *                       *
* ACPI SRAT Table                [Enabled]             *                       *
* IRXo Legacy Routing for HPET  [Disabled]             *                       *
* AMI OEMB table                 [Enabled]             *                       *
* Headless mode                  [Enabled]             *                       *
*                                                      *                       *
*                                                      *                       *
*                                                      *                       *
*                                                      *                       *
*                                                      *                       *
*                                                      * **    Select Screen   *
*                                                      * **    Select Item     *
*                                                      * +-    Change Option   *
*                                                      * F1    General Help    *
*                                                      * F10   Save and Exit   *
*                                                      * ESC   Exit            *
*                                                      *                       *
********************************************************************************
```

2.3.5.7 BIOS Advanced Menu Event Logging Details Screen

```
         Advanced
********************************************************************************
* Event Logging details                                  * View all unread events *
* ****************************************************** * on the Event Log.      *
* View Event Log                                         *                        *
* Mark all events as read                                *                        *
* Clear Event Log                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
*                                                        * **    Select Screen    *
*                                                        * **    Select Item      *
*                                                        * Enter Go to Sub Screen *
*                                                        * F1    General Help     *
*                                                        * F10   Save and Exit    *
*                                                        * ESC   Exit             *
*                                                        *                        *
*                                                        *                        *
********************************************************************************
```

2.3.5.8 BIOS Advanced Menu HyperTransport Configuration Screen

```
         Advanced
********************************************************************************
* Hyper Transport Configuration                          * The HyperTransport     *
* ****************************************************** * link will run at this  *
*                                                        * speed if it is slower  *
* CPU0:CPU1 HT Link 0 Speed        [Auto]                * than or equal to the   *
* CPU0:CPU1 HT Link 0 Width        [Auto]                * system clock and the   *
*                                                        * board is capable.      *
* CPU0:CK804 HT Link 1 Speed      [Auto]                 *                        *
* CPU0:CK804 HT Link 1 Width      [Auto]                 *                        *
*                                                       *  **    Select Screen   *
* CPU0:CPU1 HT Link 2 Speed      [Auto]                  *  **    Select Item     *
* CPU0:CPU1 HT Link 2 Width      [Auto]                  *  +-    Change Option   *
*                                                        *  F1    General Help    *
* CPU0:I04 HT Link 2 Speed      [Auto]                   *  F10   Save and Exit   *
* CPU0:I04 HT Link 2 Speed      [Auto]                   *  ESC   Exit            *
*                                                        *                        *
*                                                        *                        *
*                                                        *                        *
********************************************************************************
```

2.3.5.9 BIOS Advanced Menu IPMI Configuration Screen

```
          Advanced
*********************************************************************************
* IPMI 2.0 Configuration                                  * View all events in the *
* ******************************************************* * BMC Event Log.         *
* Status Of BMC                       Working             *                        *
* * View BMC System Event Log                             * It will take up to     *
* Reload BMC System Event Log                             * 60 Seconds approx.     *
* Clear BMC System Event Log                              * to read all            *
* * LAN Configuration                                     * BMC SEL records.       *
* * PEF Configuration                                     *                        *
* BMC Watch Dog Timer Action         [Disabled]           *                        *
*                                                         *                        *
*                                                         * **     Select Screen   *
*                                                         * **     Select Item     *
*                                                         * Enter Go to Sub Screen *
*                                                         * F1     General Help    *
*                                                         * F10    Save and Exit   *
*                                                         * ESC    Exit            *
*                                                         *                        *
*********************************************************************************
```

2.3.5.10 BIOS Advanced Menu IPMI, LAN Configuration Screen

```
          Advanced
*********************************************************************************
* LAN Configuration.                                      * Enter channel number   *
* ******************************************************* * for LAN Configuration  *
* Channel Number                     [01]                 * Command.               *
* Channel Number Status:             Channel number is OK *                        *
*                                                         * Proper value below 16. *
*  IP Assignment                     [DHCP]               *                        *
*                                                         *                        *
*  Current IP address in BMC          010.006.042.218     *                        *
*  Current MAC address in BMC         00.14.4F.3A.26.9E   *                        *
*  Current Subnet Mask in BMC         255.255.255.000     *                        *
* Current Gateway in BMC            010.006.042.001     *                    *
*                                                         *                        *
*                                                         *                        *
*                                                         *                        *
* Refresh                                                 *                        *
*                                                         * **     Select Screen   *
* * IP Address                        [010.006.042.218]   * **    Select Item      *
* * Subnet Mask                       [255.255.255.000]   * Enter Update           *
* * Default Gateway                   [010.006.042.001]   * F1     General Help    *
*                                                         * F10    Save and Exit   *
*                                                         * ESC    Exit            *
* Commit                                                  *                        *
*                                                         *                        *
*********************************************************************************
```

2.3.5.11 BIOS Advanced Menu IPMI, PEF Configuration Screen

```
          Advanced
********************************************************************************
* Set PEF Configuration Parameters Command.           * Enable or Disable PEF  *
* *************************************************** * Support.               *
* PEF SUPPORT                      [Enabled]          * Refer Table 24.6 of    *
* * PEF Action Global Control                         * IPMI Specification 1.5 *
* Alert Startup Delay              [Disabled]         *                        *
* Startup Delay                    [Disabled]         *                        *
* Event Message For PEF Action     [Disabled]         *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     * **    Select Screen    *
*                                                     * **    Select Item      *
*                                                     * +-    Change Option    *
*                                                     * F1    General Help     *
*                                                     * F10   Save and Exit    *
*                                                     * ESC   Exit             *
*                                                     *                        *
********************************************************************************
```

2.3.5.12 BIOS Advanced Menu MPS Configuration Screen

```
          Advanced
********************************************************************************
* MPS Configuration                                   * Select MPS Revision    *
* *************************************************** *                        *
* MPS Revision                     [1.4]              *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     * **    Select Screen    *
*                                                     * **    Select Item      *
*                                                     * +-    Change Option    *
*                                                     * F1    General Help     *
*                                                     * F10   Save and Exit    *
*                                                     * ESC   Exit             *
*                                                     *                        *
*                                                     *                        *
********************************************************************************
```

2.3.5.13 BIOS Advanced Menu PCI Express Configuration Screen

```
          Advanced
********************************************************************************
* PCI Express Configuration                              *                     *
* ****************************************************** *  Enable/Disable     *
*                                                        *  PCI Express L0s and *
* Active State Power Management  [Disabled]              *  L1 link power      *
* Enable HotPlug in CK804        [Enabled]               *  states             *
* Enable HotPlug in I04          [Disabled]              *                     *
*                                                        *                     *
*                                                        *                     *
*                                                        *                     *
*                                                        * **    Select Screen *
*                                                        * **    Select Item   *
*                                                        * +-    Change Option *
*                                                        * F1    General Help  *
*                                                        * F10   Save and Exit *
*                                                        * ESC   Exit          *
*                                                        *                     *
********************************************************************************
```

2.3.5.14 BIOS Advanced Menu Remote Access Configuration Screen

```
          Advanced
********************************************************************************
* Configure Remote Access type and parameters            * Select Remote Access *
* ****************************************************** * type.               *
* Remote Access                  [Enabled]               *                     *
*                                                        *                     *
* Serial port number             [COM1]                  *                     *
*      Base Address, IRQ         [3F8h, 4]               *                     *
* Serial Port Mode               [09600 8,n,1]           *                     *
* Flow Control                   [None]                  *                     *
* Redirection After BIOS POST    [Always]                *                     *
* Terminal Type                  [ANSI]                  *                     *
* VT-UTF8 Combo Key Support      [Enabled]               *                     *
* Sredir Memory Display Delay    [No Delay]              *                     *
*                                                        * **    Select Screen *
*                                                        * **    Select Item   *
*                                                        * +-    Change Option *
*                                                        * F1    General Help  *
*                                                        * F10   Save and Exit *
*                                                        * ESC   Exit          *
*                                                        *                     *
********************************************************************************
```

2.3.5.15 BIOS Advanced Menu USB Configuration Screen

```
         Advanced
********************************************************************************
* USB Configuration                                    * Enables USB controller *
* **************************************************** *                        *
* Module Version - 2.24.0-12.4                         *                        *
*                                                      *                        *
* USB Devices Enabled :                                *                        *
*   2 Keyboard, 1 Mice, 1 Hub, 2 Drives                *                        *
*                                                      *                        *
* USB Controller Support         [USB 1.1 +USB 2.0]    *                        *
* Legacy USB Support             [Enabled]             *                        *
* USB 2.0 Controller Mode        [FullSpeed]           *                        *
* BIOS EHCI Hand-Off             [Enabled]             *                        *
* Hotplug USB FDD Support        [Auto]                *                        *
* Hotplug USB CDROM Support      [Auto]                *                        *
*                                                      *                        *
* * USB Mass Storage Device Configuration              *                        *
*                                                      * **    Select Screen    *
*                                                      * **    Select Item      *
*                                                      * +-    Change Option    *
*                                                      * F1    General Help     *
*                                                      * F10   Save and Exit    *
*                                                      * ESC   Exit             *
********************************************************************************
```

2.3.6 BIOS PCI/PnP Menu Screen

```
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
********************************************************************************
* Advanced PCI/PnP Settings                              ** Clear NVRAM during     *
* ****************************************************** System Boot.           *
* WARNING: Setting wrong values in below sections        **                        *
*          may cause system to malfunction.              **                        *
*                                                        **                        *
* Clear NVRAM                      [No]                  **                        *
* Plug & Play O/S                  [No]                  **                        *
* PCI Latency Timer                [64]                  **                        *
* Allocate IRQ to PCI VGA          [Yes]                 **                        *
* Palette Snooping                 [Disabled]            **                        *
* PCI IDE BusMaster                [Disabled]            **                        *
* OffBoard PCI/ISA IDE Card        [Auto]                **                        *
* Scanning onboard SAS/SATA ROM    [Enabled]             **                        *
* Scanning onboard NIC Card        [Enabled]             ** **    Select Screen    *
*                                                        ** **    Select Item      *
*                                                        ** +-    Change Option    *
*                                                        ** F1    General Help     *
*                                                        ** F10   Save and Exit    *
*                                                        ** ESC   Exit             *
* Onboard PCI NIC MAC Address                            **                        *
*   GE NIC 1 : 00 03 BA CD 51 39                         **                        *
*   GE NIC 2 : 00 03 BA CD 51 38                         ** Size of memory block   *
*   GE NIC 3 : 00 03 BA CD 51 3B                         ** to reserve for legacy  *
*   GE NIC 3 : 00 03 BA CD 51 3B                         ** ISA devices.           *
*                                                        **                        *
* IRQ3                             [Available]           **                        *
* IRQ4                             [Reserved]            **                        *
* IRQ5                             [Available]           **                        *
* IRQ7                             [Available]           **                        *
* IRQ9                             [Available]           **                        *
* IRQ10                            [Available]           **                        *
* IRQ11                            [Available]           **                        *
* IRQ14                            [Available]           **                        *
* IRQ15                            [Available]           ** **    Select Screen    *
*                                                        ** **    Select Item      *
* DMA Channel 0                    [Available]           ** +-    Change Option    *
* DMA Channel 1                    [Available]           ** F1    General Help     *
* DMA Channel 3                    [Available]           ** F10   Save and Exit    *
* DMA Channel 5                    [Available]           ** ESC   Exit             *
* DMA Channel 6                    [Available]           **                        *
* DMA Channel 7                    [Available]           **                        *
*                                                        **                        *
* Reserved Memory Size             [Disabled]            **                        *
********************************************************************************
```

2.3.7 BIOS Boot Menu Screens

2.3.7.1 BIOS Boot Menu Main Screen

```
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
********************************************************************************
* Boot Settings                                      * Configure Settings     *
* ************************************************** * during System Boot.    *
* * Boot Settings Configuration                      *                        *
*                                                    *                        *
* * Boot Device Priority                             *                        *
* * Hard Disk Drives                                 *                        *
* * Removable Drives                                 *                        *
* * CD/DVD Drives                                    *                        *
*                                                    *                        *
*                                                    *                        *
*                                                    * **    Select Screen    *
*                                                    * **    Select Item      *
*                                                    * Enter Go to Sub Screen *
*                                                    * F1    General Help     *
*                                                    * F10   Save and Exit    *
*                                                    * ESC   Exit             *
*                                                    *                        *
*                                                    *                        *
********************************************************************************
```

2.3.7.2 BIOS Boot Menu Boot Settings Configuration Screen

```
                                Boot
********************************************************************************
* Boot Settings Configuration                        * Allows BIOS to skip    *
* ************************************************** * certain tests while    *
* Quick Boot                        [Disabled]       * booting. This will     *
* System Configuration Display      [Disabled]       * decrease the time      *
* Quiet Boot                        [Disabled]       * needed to boot the     *
* Language                          [English]        * system.                *
* AddOn ROM Display Mode            [Force BIOS]     *                        *
* Bootup Num-Lock                   [On]             *                        *
* Wait For 'F1' If Error            [Disabled]       *                        *
* Interrupt 19 Capture              [Disabled]       *                        *
* Default Boot Order                [CRHB]           *                        *
*                                                    *                        *
*                                                    * **    Select Screen    *
*                                                    * **    Select Item      *
*                                                    * +-    Change Option    *
*                                                    * F1    General Help     *
*                                                    * F10   Save and Exit    *
*                                                    * ESC   Exit             *
********************************************************************************
```

2.3.7.3 BIOS Boot Menu Boot Device Priority Screen

```
                                Boot
********************************************************************************
* Boot Device Priority                                  * Specifies the boot     *
* ***************************************************** * sequence from the      *
*                                                       * available devices.     *
* 1st Boot Device                [CD/DVD Drives]        *                        *
* 2nd Boot Device                [Removable Dev.]       * A device enclosed in   *
* 3rd Boot Device                [Hard Drive]           * parenthesis has been   *
* 4th Boot Device                [NVIDIA Boot Agent]    * disabled in the        *
* 5th Boot Device                [2-NVIDIA Boot Agent]* corresponding type     *
* 6th Boot Device                [Network:IBA GE Slo] * menu.                    *
* 7th Boot Device                [Network:IBA GE Slo] *                          *
*                                                       *                        *
*                                                       * **    Select Screen    *
*                                                       * **    Select Item      *
*                                                       * +-    Change Option    *
*                                                       * F1    General Help     *
*                                                       * F10   Save and Exit    *
*                                                       * ESC   Exit             *
*                                                       *                        *
********************************************************************************
```

2.3.7.4 BIOS Boot Menu Hard Disk Drives Screen

```
                                Boot
********************************************************************************
* Hard Disk Drives                                      * Specifies the boot     *
* ***************************************************** * sequence from the      *
* 1st Drive                      [SCSI #0400 ID00 LU] * available devices.       *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       * **    Select Screen    *
*                                                       * **    Select Item      *
*                                                       * +-    Change Option    *
*                                                       * F1    General Help     *
*                                                       * F10   Save and Exit    *
*                                                       * ESC   Exit             *
*                                                       *                        *
*                                                       *                        *
********************************************************************************
```

2.3.7.5 BIOS Boot Menu Removable Drives Screen

```
                                Boot
********************************************************************************
* Removable Drives                                    * Specifies the boot     *
* *************************************************** * sequence from the      *
* 1st Drive                      [USB:AMI Virtual F1] * available devices.     *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     * **    Select Screen    *
*                                                     * **    Select Item      *
*                                                     * +-    Change Option    *
*                                                     * F1    General Help     *
*                                                     * F10   Save and Exit    *
*                                                     * ESC   Exit             *
*                                                     *                        *
*                                                     *                        *
********************************************************************************
```

2.3.7.6 BIOS Boot Menu CD/DVD Drives Screen

```
                                Boot
********************************************************************************
* CD/DVD Drives                                       * Specifies the boot     *
* *************************************************** * sequence from the      *
* 1st Drive                      [USB:AMI Virtual CD] * available devices.     *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     *                        *
*                                                     * **    Select Screen    *
*                                                     * **    Select Item      *
*                                                     * +-    Change Option    *
*                                                     * F1    General Help     *
*                                                     * F10   Save and Exit    *
*                                                     * ESC   Exit             *
*                                                     *                        *
*                                                     *                        *
********************************************************************************
```

2.3.8 BIOS Security Settings Menu

```
   Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
********************************************************************************
* Security Settings                                     * Install or Change the  *
* ***************************************************** * password.              *
* Supervisor Password :Not Installed                    *                        *
* User Password       :Not Installed                    *                        *
*                                                       *                        *
* Change Supervisor Password                            *                        *
* Change User Password                                  *                        *
*                                                       *                        *
*                                                       *                        *
* Boot Sector Virus Protection   [Disabled]             *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       * **    Select Screen    *
*                                                       * **    Select Item      *
*                                                       * Enter Change           *
*                                                       * F1    General Help     *
*                                                       * F10   Save and Exit    *
*                                                       * ESC   Exit             *
*                                                       *                        *
*                                                       *                        *
********************************************************************************
```

2.3.9 BIOS Chipset Menu Screens

2.3.9.1 BIOS Chipset Menu Main Screen

```
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
********************************************************************************
*                                                       * Options for NB         *
* * NorthBridge Configuration                           *                        *
* * SouthBridge Configuration                           *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       * **    Select Screen    *
*                                                       * **    Select Item      *
*                                                       * Enter Go to Sub Screen *
*                                                       * F1    General Help     *
*                                                       * F10   Save and Exit    *
*                                                       * ESC   Exit             *
*                                                       *                        *
*                                                       *                        *
********************************************************************************
```

2.3.9.2 BIOS Chipset Menu NorthBridge Configuration Screen

```
                                                          Chipset
********************************************************************************
* NorthBridge Chipset Configuration                    *                         *
* **************************************************** *                         *
* * Memory Configuration                               *                         *
* * ECC Configuration                                  *                         *
* Power Down Control             [Disabled]            *                         *
* Set CPU speed to 2GHz          [Disabled]            *                         *
* **************************************************** *                         *
* Alternate VID                  [Auto]                *                         *
* Memory Timing Parameters       [CPU Node 0]          *                         *
*   Memory CLK             :333 MHz                    *                         *
*   CAS Latency(Tcl)       :5.0                        *                         *
*   RAS/CAS Delay(Trcd)    :5 CLK                      *                         *
*   Min Active RAS(Tras)   :15 CLK                      *                        *
*   Row Precharge Time(Trp):5 CLK                      * **    Select Screen     *
*   RAS/RAS Delay(Trrd)    :3 CLK                      * **    Select Item       *
*   Row Cycle (Trc)        :21 CLK                     * Enter Go to Sub Screen *
*   Asynchronous Latency   :6 ns                       * F1    General Help      *
*                                                      * F10   Save and Exit     *
*                                                      * ESC   Exit              *
*                                                      *                         *
*                                                      *                         *
********************************************************************************
```

2.3.9.3 BIOS Chipset Menu NorthBridge Memory Configuration Screen

```
                                                          Chipset
********************************************************************************
* Memory Configuration                                 * Select the DRAM         *
* **************************************************** * Frequency programming   *
* Memclock Mode                  [Auto]                * method. If Auto,        *
* MCT Timing Mode                [Auto]                * the DRAM speed will     *
* Bank Interleaving              [Auto]                * be based on SPDs.       *
* Node Interleaving              [Disabled]            * If Limit, the DRAM spe *
* Enable Clock to All DIMMs      [Disabled]            * will not exceed the     *
* MemClk Tristate C3/ATLVID      [Disabled]            * specified value. If     *
* Memory Hole Remapping          [Disabled]            * Manual, the DRAMs       *
*                                                      * specified will be       *
*                                                      * programmed regardless   *
*                                                      *                         *
*                                                      * **    Select Screen     *
*                                                      * **    Select Item       *
*                                                      * +-    Change Option     *
*                                                      * F1    General Help      *
*                                                      * F10   Save and Exit     *
*                                                      * ESC   Exit              *
********************************************************************************
```

2.3.9.4 BIOS Chipset Menu NorthBridge ECC Configuration Screen

```
                                                                Chipset
********************************************************************************
* ECC Configuration                                     * DRAM ECC allows        *
* ***************************************************** * hardware to report     *
* DRAM ECC Enable                  [Enabled]            * and correct memory     *
*   4-bit ECC Mode                 [Enabled]            * errors automatically   *
*   DRAM SCRUB REDIRECT            [Enabled]            * maintaining system     *
*   DRAM BG Scrub                  [163.8us]            * integrity.             *
* L2 Cache BG Scrub                [10.2us]             *                        *
* Data Cache BG Scrub              [5.12us]             *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       *                        *
*                                                       * **    Select Screen    *
*                                                       * **    Select Item      *
*                                                       * +-    Change Option    *
*                                                       * F1    General Help     *
*                                                       * F10   Save and Exit    *
*                                                       * ESC   Exit             *
*                                                       *                        *
*                                                       *                        *
********************************************************************************
```

2.3.9.5 BIOS Chipset Menu SouthBridge Configuration Screen

```
                                                               Chipset
********************************************************************************
* South Bridge Chipset Configuration                    * Enable or Disable      *
* ***************************************************** * SMBUS Controller       *
* SMBus Interface                  [Enabled]            *                        *
*                                                       *                        *
* MAC Interface                    [Enabled]            *                        *
* I04 MAC Interface                [Enabled]            *                        *
* MAC Bridge Mode                  [Auto]               *                        *
* MAC Media Interface              [Auto]               *                        *
* MAC Option ROM                   [Auto]               *                        *
*                                                       *                        *
* Onboard IO APIC                  [Auto]               *                        *
*                                                       *                        *
* CPU Spread Spectrum              [Down Spread]        * **    Select Screen    *
* SATA Spread Spectrum             [Disabled]           * **    Select Item      *
* PCI-Express Spread Spectrum      [Disabled]           * +-    Change Option    *
*                                                       * F1    General Help     *
* Primary Video                    [Master PCI-Express] * F10   Save and Exit    *
*                                                       * ESC   Exit             *
* Restore on AC/Power Loss         [Last State ]        *                        *
* Power Button Behavior            [Instant Off]        *                        *
********************************************************************************
```

2.3.10 BIOS Exit Option Menu Screen

```
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
********************************************************************************
* Exit Options                                         * Exit system setup     *
* **************************************************** * after saving the      *
* Save Changes and Exit                                * changes.              *
* Discard Changes and Exit                             *                       *
* Discard Changes                                      * F10 key can be used   *
*                                                      * for this operation.   *
* Load Optimal Defaults                                *                       *
*                                                      *                       *
*                                                      *                       *
*                                                      *                       *
*                                                      *                       *
*                                                      * **    Select Screen   *
*                                                      * **    Select Item     *
*                                                      * Enter Go to Sub Screen *
*                                                      * F1    General Help    *
*                                                      * F10   Save and Exit   *
*                                                      * ESC   Exit            *
*                                                      *                       *
*                                                      *                       *
********************************************************************************
```

2.4 Modifying Settings Using Jumpers

The following sections show how to modify system settings using jumpers on the server motherboard:

- Section 2.4.1, "Using the Clear CMOS Jumper J1330" on page 2-28
- Section 2.4.2, "Resetting SP and BIOS Passwords Using Jumper J1303" on page 2-29
- Section 2.4.3, "Using the Force-Recovery Jumper J1302" on page 2-30

FIGURE 2-5 shows the header pin locations on the Sun Fire X6220 server module that are referenced in the following procedures.

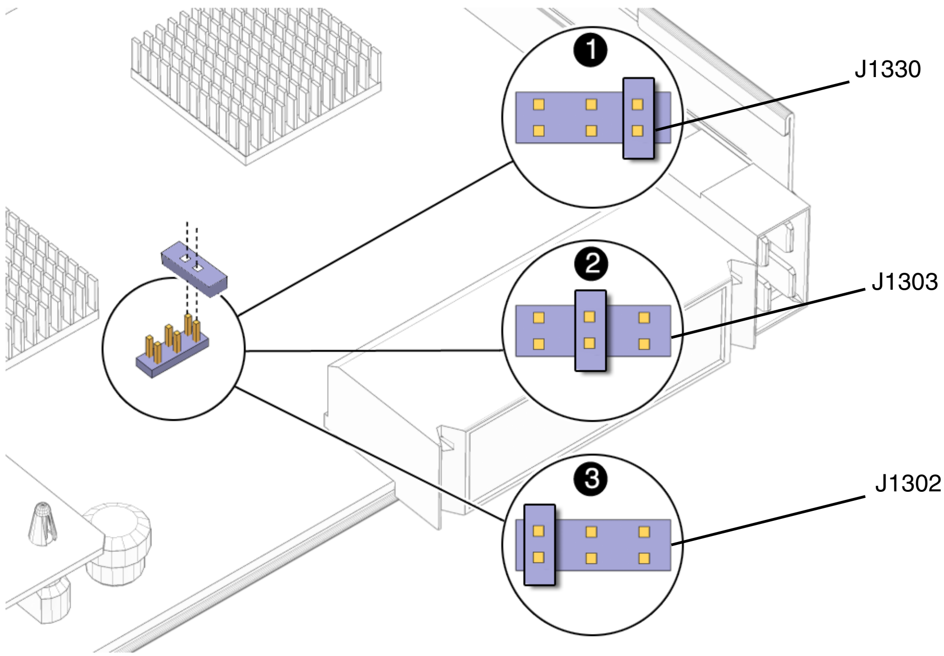


FIGURE 2-5 Header Pin Locations

2.4.1 Using the Clear CMOS Jumper J1330

You can use this jumper to clear the server's CMOS settings in the case of a system hang. For example, if the server hangs because of incorrect settings and does not boot, use this jumper to invalidate the settings and reboot with defaults.

1. **Shut down the server to standby power mode by using a stylus, or other pointed object, to press and release the recessed Power button on the front panel.**

   See Section 2.2, "Powering Off the Server" on page 2-4.

Caution – Before handling components, attach an ESD wrist strap to the grounding post that is built into the rear of the chassis. The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

---

2. **Remove the server module from the chassis.**
3. **Remove the main cover from the server.**

   See Section 4.2.2, "Removing the Main Cover" on page 4-4.
4. **Install the shorting jumper across the J1330 header pins.**

   See FIGURE 2-5 for the header pin location.
5. **Wait 10 seconds, and then remove the shorting jumper.**

   This jumper removes battery power from the SouthBridge chipset, where the CMOS settings are stored, thereby removing the CMOS settings.
6. **Reinstall the main cover to the server.**
7. **Reinstall the server module into the server.**
8. **Press the Power button to power up the server.**

   The server powers up to standby power mode, indicated when the Power/OK LED on the front panel is flashing.

2.4.2 Resetting SP and BIOS Passwords Using Jumper J1303

This procedure describes how to reset the Administration password (the root password) for the ILOM Service Processor back to the default after it has been set once during initial setup.

Note – This procedure simultaneously removes any BIOS password that was set.

---

1. **Shut down the server to standby power mode by using a stylus, or other pointed object, to press and release the recessed Power button on the front panel.**

   See Section 2.2, "Powering Off the Server" on page 2-4.

Caution – Before handling components, attach an ESD wrist strap to the grounding post that is built into the rear of the chassis. The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

---

2. **Remove the server module from the chassis.**

   See Section 4.2.1, "Removing the Server Module From the Chassis" on page 4-2.

3. **Remove the main cover from the server.**

   See Section 4.2.2, "Removing the Main Cover" on page 4-4.

4. **Install the shorting jumper across the J1303 header pins.**

   See FIGURE 2-5 for the header pin location.

   This jumper's function is to clear the ILOM SP password.

5. **Reinstall the main cover to the server.**

6. **Reinstall the server module into the chassis.**

7. **Return the server to main power mode by using a stylus, or other pointed object, to press and release the recessed Power button on the front panel.**

Note – You must allow the entire server, not just the SP, to reboot to main power mode to complete the password reset. This is because the state of this jumper cannot be determined without the host CPU running. Wait until the end of POST, when you see the `CMOS password cleared by jumper` message, after which both the BIOS and SP passwords are reset.

- The ILOM SP password is reset to the default, `changeme`.

- The BIOS password is also reset by a separate operation performed by the BIOS when it discovers the presence of this jumper. The BIOS password is not reset to `changeme`; it is removed so that there is no longer a BIOS password set. If you had a BIOS password set, you are no longer prompted for one.

8. **Log in to the ILOM web GUI using `root` as the user name and `changeme` as the password.**

   Refer to the *Integrated Lights Out Manager Administration Guide for ILOM 1.1.1*, 820-0280.

9. **Change the default password to a password of your choice.**

10. **Repeat Steps 1 through 7 to remove the J1303 jumper. (Remove the jumper in Step 4 rather than inserting it.)**

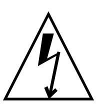
Note – If you do not remove this jumper, the ILOM SP and BIOS passwords will be reset every time you power cycle the server.

2.4.3 Using the Force-Recovery Jumper J1302

You can use this jumper to force the server to flash a new BIOS, in the case of a system hang. For example, if the system hangs after an ILOM SP firmware/BIOS update, use this procedure to force the server to look for the new BIOS.

1. **Shut down the server to standby power mode by using stylus, or other pointed object, to press and release the recessed Power button on the front panel.**

   See Section 2.2, “Powering Off the Server” on page 2-4.



Caution – Before handling components, attach an ESD wrist strap to the grounding post that is built into the rear of the chassis. The system’s printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

---

2. **Remove the server module from the chassis.**

   See Section 4.2.1, “Removing the Server Module From the Chassis” on page 4-2.

3. **Remove the main cover from the server.**

   See Section 4.2.2, “Removing the Main Cover” on page 4-4.

4. **Install the shorting jumper across the J1302 header pins.**

   See FIGURE 2-5 for the jumper location.

   This jumper’s function is to instruct the system to force recovery of the latest BIOS at system reboot.

5. **Reinstall the main cover to the server.**

6. **Reinstall the server module into the chassis.**

7. **Return the server to main power mode by using a stylus, or other pointed object, to press and release the recessed Power button on the front panel.**

   You must fully power on the server to complete the reset. This is because the state of this jumper cannot be determined without the host CPU running.

8. **Repeat Steps 1 through 7 to remove the J1302 jumper. (Remove the jumper in Step 4 rather than inserting it.)**

Note – If you do not remove this jumper, the server forces a recovery of the new BIOS every time that you power cycle the server.

2.5 Updating the BIOS

The BIOS is updated whenever you update the ILOM Service Processor firmware. For instructions on updating the firmware, refer to the *Integrated Lights Out Manager Administration Guide for ILOM 1.1.1*, 820-0280.

2.6 Power-On Self-Test (POST)

For information about BIOS POST, POST codes, POST code checkpoints, and console redirection, see Appendix B.

CHAPTER 3

Diagnostics Tools

This chapter contains information about diagnostic tools that you can use to determine the status of the Sun Blade X6220 server module and components.

This chapter contains the following topics:

3.1 Service Processor ILOM

The following component information is available through the service processor (SP) Integrated Lights Out Manager (ILOM).

- Viewing replaceable component information
- Viewing sensors and LED indicators
- Viewing indicators (LEDs) and controlling the locate LED
- Managing alerts
- Viewing and clearing the system event log

See the *Integrated Lights Out Manager (ILOM) Administration Guide for ILOM 1.1.1*, 820-0280, for more information.

3.2 System Status LEDs

The Sun Blade X6220 server module has external and internal system status LEDs.

3.2.1 External Status Indicator LEDs

FIGURE 3-1 shows the locations of the external status indicator LEDs.

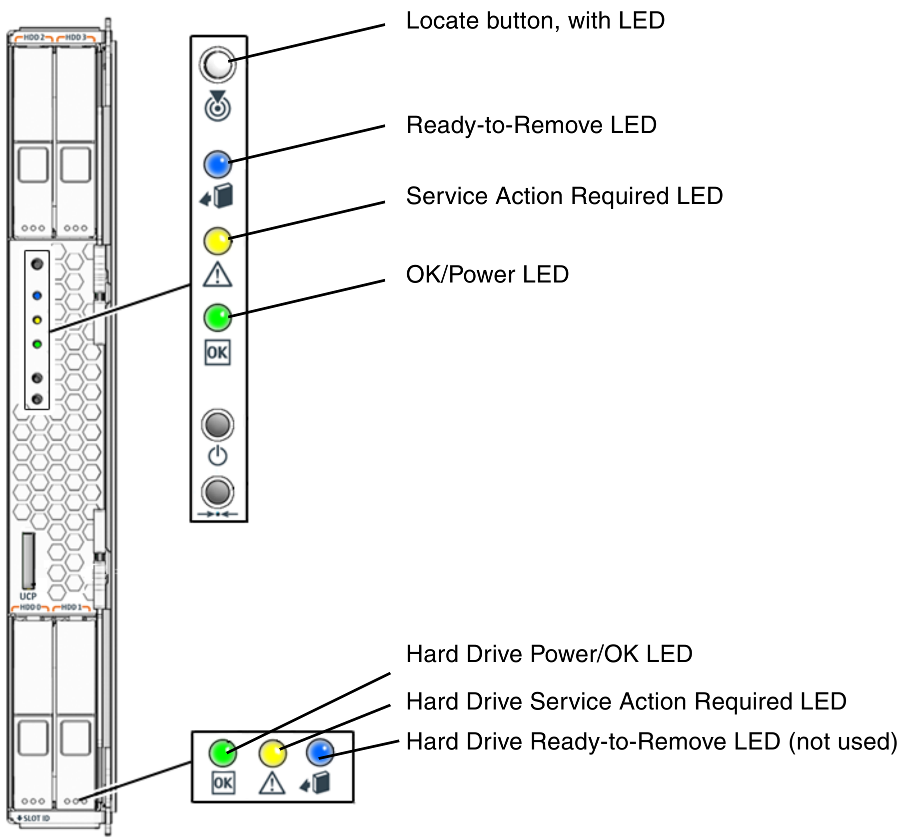


FIGURE 3-1 External LED Location

Refer to TABLE 3-1 for descriptions of the LED behavior.

TABLE 3-1 Front Panel LED Functions

LED Name	Description
Locate button/LED	This LED helps you to identify which system in the rack you are working on in a rack full of servers. • Push and release this button to make the Locate LED blink for 30 minutes. • Hold down the button for 5 seconds to initiate a "push-to-test" mode that illuminates all other LEDs both inside and outside the chassis for 15 seconds.
Ready-to-Remove LED	The server module is ready to be removed from the chassis. This LED is switched on by the service processor when the server module main power is off.
Service Action Required LED	This LED has three states: • Off: Normal operation. • Slow Blinking: A new (unacknowledged) event requiring a service action has been detected. • On: The event has been acknowledged, but the problem still requires attention.
Power/OK LED	This LED has three states: • Off: Server main power and standby power are off. • Standby Blinking: Standby power is on, but main power is off. • Slow Blinking: POST or diagnostics are running. • On: Server is in main power mode with power supplied to all components.
Hard Disk Drive Status LEDs	The hard disk drives have three LEDs. The order listed below is when the server module is installed in the chassis: • Right LED (green): Fast blink means normal disk activity, slow blink means RAID activity, and off means power is off or no disk activity. • Middle LED (amber): System has detected a hard disk fault. This LED is controlled by the service processor. • Top LED (blue): This LED is not used.

3.2.2 Internal Status Indicator LEDs

These servers have internal status indicator LEDs for the DIMM slots and the CPUs.

When the board is removed from the chassis, you can press a fault indicator button to view the location of the DIMM or CPU that has failed.

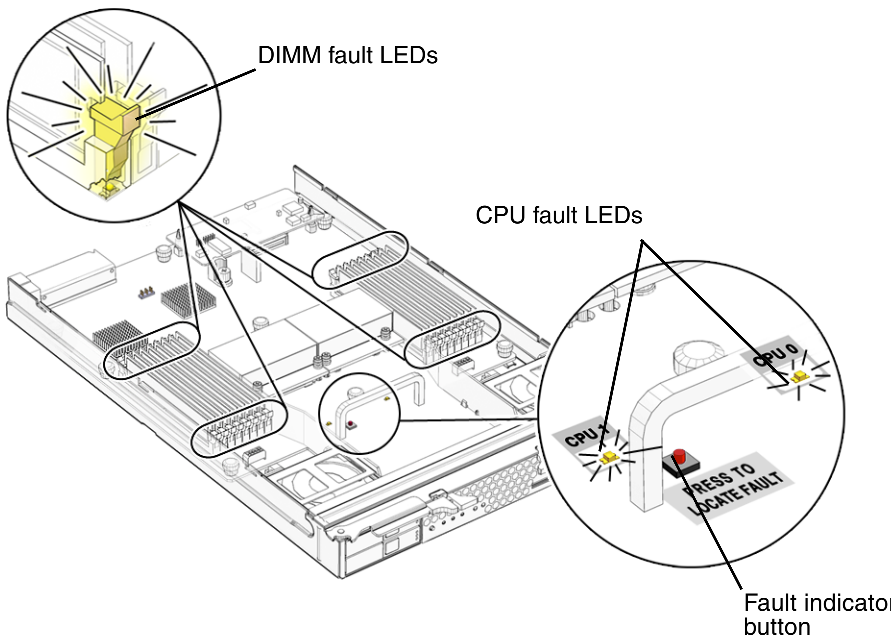


FIGURE 3-2 Fault Indicator Button

See TABLE 3-2 for internal LED behavior.

TABLE 3-2 Internal LED Functions

LED Name	Description
DIMM Fault LED (The ejector levers on the DIMM slots are the LEDs.)	This LED has two states: • Off: DIMM is operating properly. • Lit (amber): The system has detected a fault with the DIMM.
CPU Fault LED (on motherboard)	This LED has two states: • Off: CPU is operating properly. • Lit (amber): The system has detected a fault with the CPU.

3.3 BIOS POST

The system BIOS provides a rudimentary power-on self-test (POST). The basic devices required for the server to operate are checked, memory is tested, the LSI 1068 disk controller and attached disks are probed and enumerated, and the two dual-gigabit Ethernet controllers are initialized.

The progress of the self-test is indicated by a series of POST codes. Refer to Appendix B for information on BIOS POST codes.

These codes are displayed at the bottom right corner of the system's VGA screen (once the self-test has progressed far enough to initialize the video monitor). However, the codes are displayed as the self-test runs, and they scroll off the screen too quickly to be read. An alternate method of displaying the POST codes is to redirect the output of the console to a serial port (see Section 3.3.2, "Redirecting Console Output" on page 3-6).

The message `BMC Responding` is displayed at the end of the POST.

3.3.1 How BIOS POST Memory Testing Works

The BIOS POST memory testing is performed as follows:

1. The first megabyte of DRAM is tested by the BIOS before the BIOS code is shadowed (that is, copied from ROM to DRAM).

2. Once executing out of DRAM, the BIOS performs a simple memory test (a write/read of every location with the pattern `55aa55aa`).

Note – This memory test is performed only if Quick Boot is *not* enabled from the Boot Settings Configuration screen. Enabling Quick Boot causes the BIOS to skip the memory test. See Section 3.3.3, "Changing POST Options" on page 3-7 for more information.

---

3. The BIOS polls the memory controllers for both correctable and uncorrectable memory errors and logs those errors into the service processor.

3.3.2 Redirecting Console Output

Use these instructions to access the service processor and redirect the console output so that the BIOS POST codes can be read.

1. **Connect a dongle cable to the server module universal connector port (UCP). See** FIGURE 1-2**.**
2. **Connect a monitor to the dongle cable video port and a keyboard to a USB port.**
3. **Power cycle or power on the server.**
4. **Initialize the BIOS setup utility by pressing the F2 key while the system is performing the power-on self-test (POST).**
5. **When the BIOS Main Menu screen is displayed, select Advanced.**
6. **When the Advanced Settings screen is displayed, select IPMI 2.0 Configuration.**
7. **When the IPMI 2.0 Configuration screen is displayed, select the LAN Configuration menu item.**
8. **Select the IP Address menu item.**

   The service processor's IP address is displayed in the following format:
   `Current IP address in BMC: xxx.xxx.xxx.xxx`
9. **Start a web browser and type the service processor's IP address in the browser's URL field.**
10. **When you are prompted, type a user name and password as follows:**

    User name: **`root`**
    Password: **`changeme`**
11. **When the ILOM Service Processor GUI screen is displayed, click the Remote Control tab.**
12. **Click the Redirection tab.**
13. **Set the color depth for the redirection console at either 6 or 8 bits.**
14. **Click the Start Redirection button.**

    The remote console window appears and prompts you for your user name and password again.
15. **When you are prompted, type a user name and password as follows:**

    User name: **`root`**
    Password: **`changeme`**

    The current POST screen is displayed.

3.3.3 Changing POST Options

These instructions are optional, but you can use them to change the operations that the server performs during POST.

1. **Connect a dongle cable to the server module universal connector port (UCP). See** FIGURE 1-2**.**
2. **Connect a monitor to the dongle cable video port and a keyboard to a USB port.**
3. **Initialize the BIOS setup utility by pressing the F2 key while the system is performing the power-on self-test (POST).**
4. **When the BIOS Main Menu screen is displayed, select the Boot menu.**
5. **From the Boot Settings screen, select Boot Settings Configuration.**
6. **On the Boot Settings Configuration screen, there are several options that you can enable or disable:**
   - **Quick Boot:** This option is disabled by default. If you enable it, the BIOS skips certain tests while booting, such as the extensive memory test. This decreases the time it takes for the system to boot.
   - **System Configuration Display:** This option is disabled by default. If you enable it, the system configuration screen is displayed before booting begins.
   - **Quiet Boot:** This option is disabled by default. If you enable it, the Sun Microsystems logo is displayed instead of POST codes.
   - **Language:** This option is reserved for future use. Do not change.
   - **Add On ROM Display Mode:** This option is set to Force BIOS by default. This option is enabled only if you have also enabled the Quiet Boot option, but it controls whether output from the Option ROM is displayed. The two settings for this option are as follows:
     - **Force BIOS:** Remove the Sun logo and display Option ROM output.
     - **Keep Current:** Do not remove the Sun logo. The Option ROM output is not displayed.
   - **Boot Num-Lock:** This option is set to On by default (keyboard Num-Lock is turned on during boot). If you set this to Off, the keyboard Num-Lock is not turned on during boot.
   - **Wait for F1 if Error:** This option is disabled by default. If you enable it, the system pauses if an error is found during POST and resumes only when you press the F1 key.
   - **Interrupt 19 Capture:** This option is reserved for future use. Do not change.
   - **Default Boot Order:** The letters in the brackets represent the boot devices. To see the letters defined, position your cursor over the field and read the definition on the right side of the screen.

3.4 Hardware Debug Tool (HDT)

The hardware debug tool (HDT) is a diagnostic tool that allows access to all memory spaces and CPU registers of the system.

3.4.1 HDT Functionality

Available functionality includes:

- Access to CPU registers and memory spaces
- Automated diagnostics
- Checking of all HT links for errors at different speeds and widths
- Testing of BIOS flash access and BIOS progress
- Testing of access to other board components

HDT can be used to:

- Check the status and configuration of system
- Diagnose the system with the following symptoms:
  - No video
  - System hang (any bad HT link will cause this)
  - BIOS POST failure before video comes up

Note – HDT diagnostics will stop or reset and power cycle the system. Do not use HDT while the operating system is running.

3.4.2 HDT Access

You can access HDT through the server module SP as follows:

- **Log in to system the SP with the following login:**

`Username:` **`sunservice`**

`Password:` **`changeme`**

3.4.3 HDT Commands

- To query HDT, execute:

```
# hdtl -q
```

This command does the following:

- Dumps the current system status and configuration.
- Power cycles the stem and executes the HyperTransport Link test.
- Dumps the system status and configuration after another clean start.

Note – On a nonresponsive system, run this command before the system is reset or power cycled.

- To log output to the default location (`/coredump/debug.log`), execute:

```
# hdt -l -q
```

- To log output to a specified log file, execute:

```
# hdt -l logfile_name -qa
```

Where *path/logfile_name* is the path and file location.

3.5 SunVTS Diagnostic Tests

The Sun Blade X6220 server module is shipped with a Bootable Diagnostics CD (705-7852) that contains SunVTS™ software.

SunVTS is the Sun Validation Test Suite, which provides a comprehensive diagnostic tool that tests and validates Sun hardware by verifying the connectivity and functionality of most hardware controllers and devices on Sun platforms. SunVTS software can be tailored with modifiable test instances and processor affinity features.

The current x86 support is for the 32-bit operating system only. Only the following tests are supported on x86 platforms:

- CPU Test (cputest)
- Disk and Floppy Drives Test (disktest)
- Data Translation Look-aside Buffer (dtlbtest)
- Floating Point Unit Test (fputest)
- Network Hardware Test (nettest)
- Ethernet Loopback Test (netlbtest)
- Physical Memory Test (pmemtest)
- Serial Port Test (serialtest)
- System Test (systest)
- Universal Serial Bus Test (usbtest)
- Virtual Memory Test (vmemtest)

SunVTS software has a sophisticated graphical user interface (GUI) that provides test configuration and status monitoring. You can run the GUI on one system to display the SunVTS testing of another system on the network. SunVTS software also provides a TTY-mode interface for situations in which running a GUI is not possible.

3.5.1 SunVTS Documentation

SunVTS documentation is included on the Bootable Diagnostics CD (705-7852).You can also access SunVTS documentation at this site:

`http://docs.sun.com/app/docs/coll/1140.2`

3.5.2 Diagnosing Server Problems With the Bootable Diagnostics CD

SunVTS software is preinstalled on these servers. The server is also shipped with the Bootable Diagnostics CD (705-7852). This CD is designed so that the server boots from the CD. This CD boots the Solaris™ Operating System and starts SunVTS software. Diagnostic tests runs and write output to log files that the service technician can use to determine the problem with the server.

3.5.2.1 Requirements

To use the Bootable Diagnostics CD, you must have either a keyboard, mouse, and monitor attached to the server on which you are performing diagnostics, or a remote console server if you run the diagnostics CD remotely.

3.5.2.2 Using the Bootable Diagnostics CD

To use the Bootable Diagnostics CD to perform diagnostics:

1. **Set up the Bootable Diagnostics CD to run on a local or remote server.**
   - If you want to run the CD from a remote server using ILOM, see the *Integrated Lights Out Manager (ILOM) Administration Guide for ILOM 1.1.1*, 820-0280, for instructions on running the CD remotely.
   - If you want to run the CD on the local server, continue with the following steps:

   a. **Attach the dongle to the server UCP port. See** FIGURE 1-2**.**

   b. **Attach a USB CD or DVD drive to a USB port on the dongle cable.**

   c. **With the server powered on, insert the Bootable Diagnostics CD into the CD/DVD-ROM drive.**

   d. **Reboot the server, but press F2 during the start of the reboot so that you can change the BIOS setting for boot-device priority.**

   e. **When the BIOS Main menu appears, navigate to the BIOS Boot menu.**

   Instructions for navigating within the BIOS screens are printed on the BIOS screens.

   f. **On the BIOS Boot menu screen, select Boot Device Priority.**

   The Boot Device Priority screen appears.

   g. **Select the CD-ROM drive as the primary boot device.**

   h. **Save and exit the BIOS screens.**

   i. **Reboot the server.**

   When the server reboots from the CD in the CD- or DVD-ROM drive, the Solaris Operating System boots and SunVTS software starts and opens its first GUI window.

2. **In the SunVTS GUI, press Enter or click the Start button when you are prompted to start the tests.**

   The test suite runs until it encounters an error or the test is completed.

Note – The CD takes approximately nine minutes to boot.

---

3. **When SunVTS software completes the test, review the log files generated during the test.**

   SunVTS provides access to four separate log files:

   - SunVTS test error log contains time-stamped SunVTS test error messages. The log file path name is `/var/opt/SUNWvts/logs/sunvts.err`. This file is not created until a SunVTS test failure occurs.
   - SunVTS kernel error log contains time-stamped SunVTS kernel and SunVTS probe errors. SunVTS kernel errors are errors that relate to running SunVTS, and not to the testing of devices. The log file path name is `/var/opt/SUNWvts/logs/vtsk.err`. This file is not created until SunVTS reports a SunVTS kernel error.
   - SunVTS information log contains informative messages that are generated when you start and stop the SunVTS test sessions. The log file path name is `/var/opt/SUNWvts/logs/sunvts.info`. This file is not created until a SunVTS test session runs.
   - Solaris system message log is a log of all the general Solaris events logged by `syslogd`. The path name of this log file is `/var/adm/messages`.

   a. **Click the Log button.**

      The log file window is displayed.

   b. **Specify the log file that you want to view by selecting it from the log file window.**

      The content of the selected log file is displayed in the window.

   c. **With the three lower buttons you can do the following actions:**

      - **Print the log file:** A dialog box appears for you to specify your printer options and printer name.
      - **Delete the log file:** The file remains displayed, but it will be gone the next time you try to display it.
      - **Close the log file window:** The window is dismissed.

Note – If you want to save the log files: You must save them to another networked system or to a removable media device. When you use the Bootable Diagnostics CD, the server boots from the CD. Therefore, the test log files are not on the server’s hard disk drive and they are deleted when you power cycle the server.

CHAPTER 4

Maintaining the Sun Blade X6220 Servers

This chapter contains information and procedures for servicing the Sun Blade X6220 server module hardware, including component removal and replacement procedures.

The following topics are covered in this chapter:

- Section 4.1, “Tools and Supplies Needed” on page 4-1
- Section 4.2, “Removing the Server Module From the Chassis and Removing the Cover” on page 4-2
- Section 4.3, “Locations of Replaceable Components” on page 4-5
- Section 4.4, “Replaceable Component Procedures” on page 4-6

4.1 Tools and Supplies Needed

You can service the server with the following items:

- No. 2 Phillips screwdriver
- Adjustable-setting torque driver (5–20 in.-lbs)
- Antistatic wrist strap
- Stylus, or other pointed object (to press the recessed Power button)
- Long-nosed pliers (optional for service processor [SP] board removal)

4.2 Removing the Server Module From the Chassis and Removing the Cover

Use the preparatory procedures in this section when you are referred to them from the removal and replacement procedures.

Caution – Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shut down.

4.2.1 Removing the Server Module From the Chassis

To replace components for the Sun Blade X6220 server module, with the exception of the hard drives, you need to remove the server module from the chassis. If you are only removing hard drives, you can skip this section and go to Section 4.4.1, "Replacing a Hard Disk Drive" on page 4-6.

1. **Choose a method for shutting down the server from main power mode to standby power mode.**

   See FIGURE 1-1 for the location of the power button.

   - **Graceful shutdown:** Use **a sty**lus, or other pointed object, to press and release the recessed Power button on the front panel. This causes Advanced Configuration and Power Interface (ACPI) enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems shut down to standby power mode immediately.
   - **ILOM shutdown:** Use the ILOM CLI or Web GUI to power off the system.

     At the ILOM command prompt, type:

     ```
     stop /SYS
     ```

     See the *Integrated Lights Out Manager Administration Guide for ILOM 1.1.1*, 820-0280, for more information.

   When the main power is off, the Power/OK LED on the front panel begins flashing, indicating that the server is in standby power mode.

Note – When you use the Power button to enter standby power mode, power is still directed to the SP board and power supply fans, indicated when the Power/OK LED is flashing. To completely power off the server, you must remove the server module from the midplane.

---

2. **Turn off any peripheral devices connected to the dongle, and disconnect the dongle from the server.**

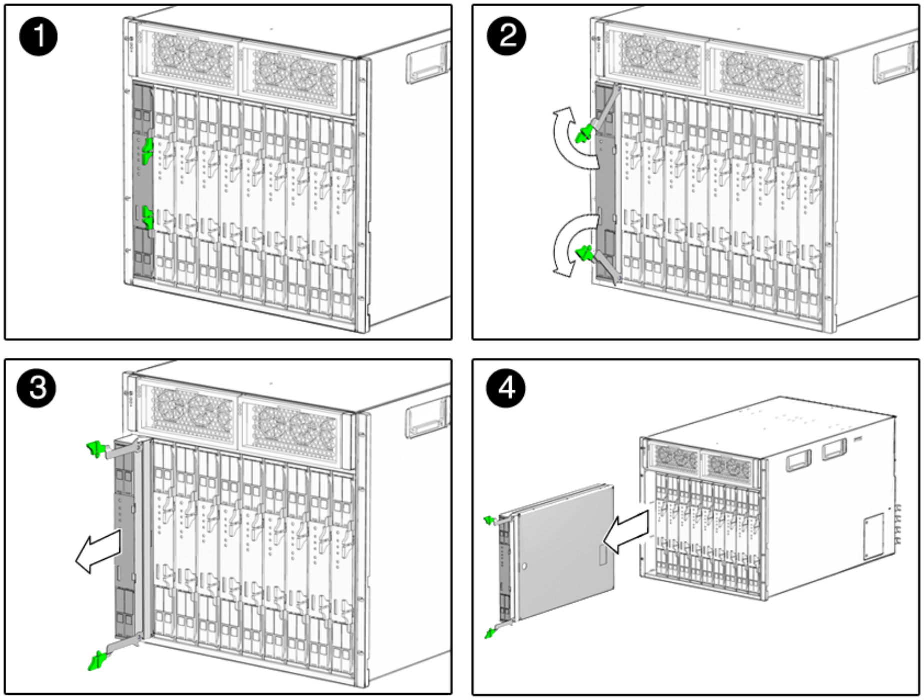


FIGURE 4-1 Removing a Server Module

3. **Remove the server module from the chassis. See FIGURE 4-1.**

   a. **Press together and hold green ejector buttons.**

   b. **Open the ejector levers by rotating them out from the server module.**

   c. **Pull the server module out from the chassis by the ejector levers until you are able to grasp the module with both hands to pull it out of the chassis.**

4. **Set the server module on an antistatic surface.**

5. **Install a filler panel into the server module slot if the server module will be out of the chassis for more than one minute.**

Caution – Before handling internal components of the server module, attach an electrostatic-discharge (ESD) wrist strap to the grounding post that is built into the rear of the chassis. The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

4.2.2 Removing the Main Cover

1. **Press down on the cover release button and, using the indent for leverage, slide the main cover toward the rear of the chassis approximately 0.5 inch (12 mm). See** FIGURE 4-2**.**

2. **Grasp the cover by its rear edge and lift it straight up from the chassis.**

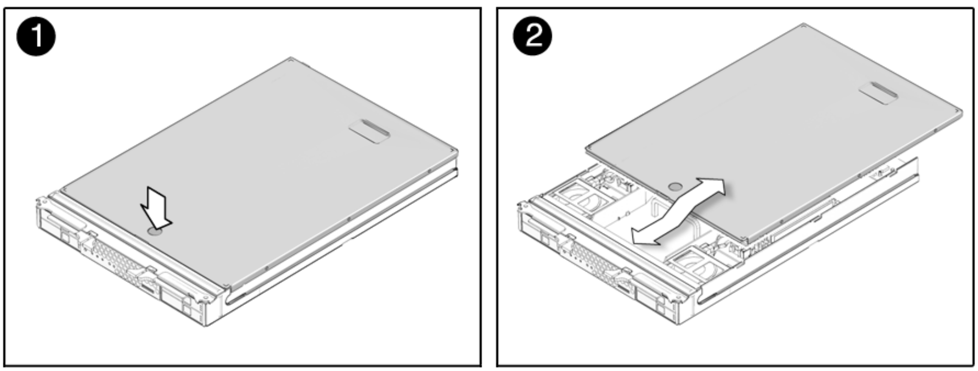


FIGURE 4-2 Removing the Main Cover

4.3 Locations of Replaceable Components

FIGURE 4-3 shows the locations of the replaceable Sun Blade X6220 server module components that are documented in this chapter.

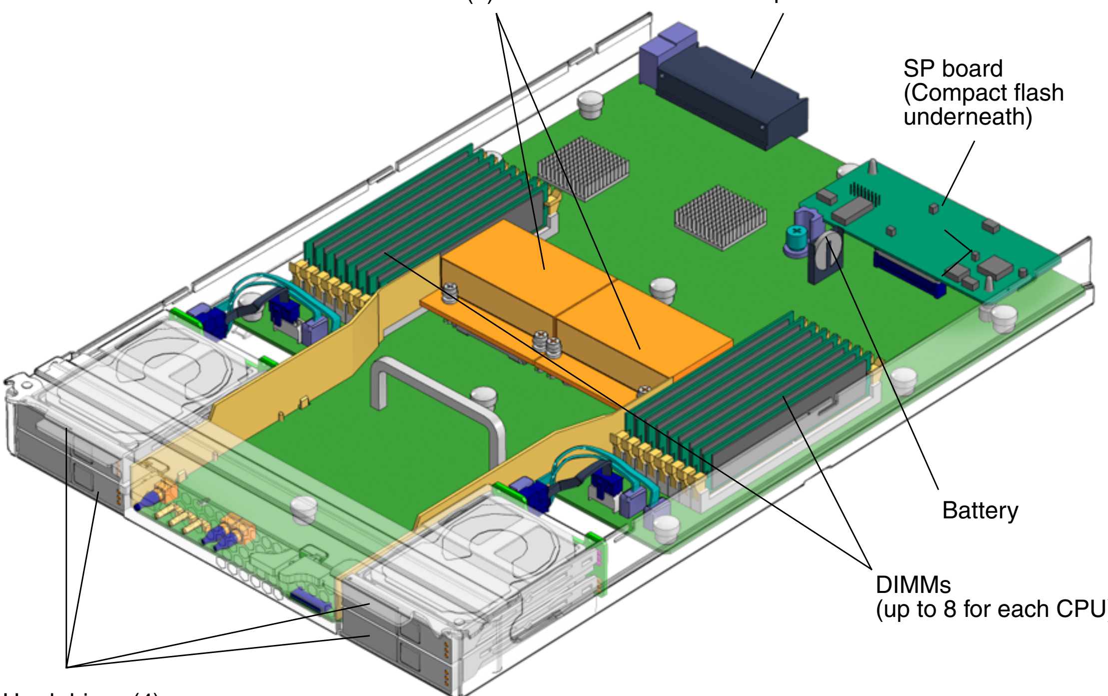


FIGURE 4-3 Sun Blade X6220 Server Module Replaceable Component Locations

4.4 Replaceable Component Procedures

Note – Some of the procedures in this section are for customer-replaceable units (CRUs) and some are for field-replaceable units (FRUs), as noted in the procedures and in the list below. FRU components should be replaced *only* by trained service technicians. Contact your Sun Service representative for assistance with FRU replacements.

This section contains procedures for replacing the following components:

- Section 4.4.1, "Replacing a Hard Disk Drive" on page 4-6 (CRU)
- Section 4.4.2, "Replacing the Battery" on page 4-10 (CRU)
- Section 4.4.3, "Replacing the Compact Flash Module" on page 4-11(CRU)
- Section 4.4.4, "Replacing Memory Modules (DIMMs)" on page 4-12 (CRU)
- Section 4.4.5, "Replacing the SP Board" on page 4-17 (CRU)
- Section 4.4.6, "Replacing a CPU and Heatsink" on page 4-19 (FRU)
- Section 4.4.7, "Replacing the Motherboard" on page 4-25 (FRU)

Caution – Before handling components, attach an ESD wrist strap to the grounding post that is built into the rear of the chassis. The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

4.4.1 Replacing a Hard Disk Drive

Follow these steps to remove and replace a hard disk drive (HDD).

Note – This component is a hot-swappable CRU and can be replaced by anyone.

The internal system software designation of the HDDs is shown in FIGURE 4-4.

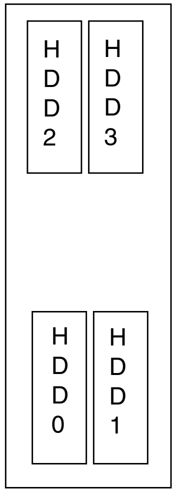


FIGURE 4-4 Designation of Hard Disk Drives

A single HDD failure does not cause a data failure if the HDDs are configured as a mirrored RAID 1 volume (optional). The HDD can be hot-swapped, and when a new HDD is inserted, the contents are automatically rebuilt from the rest of the array with no need to reconfigure the RAID parameters. If the bad HDD was configured as a hotspare, the new HDD is automatically configured as a new hotspare.

Caution – Possible data loss: If you insert an HDD that has been configured with a RAID volume into a server that did not previously have its HDDs configured with RAID volumes, the existing HDDs in the server will be converted to RAID volumes during automatic synchronization and any existing data on the existing HDDs in the server are erased. Before permanently removing an HDD that is part of an active RAID volume, use the MegaRAID Storage Manager-Integrated RAID (MSM-IR) to delete the RAID volume from the HDD to avoid causing this problem.

For information about the implementation of RAID on this server and instructions on how to use the MSM-IR (MegaRAID Storage Manager-Integrated RAID) utility to create RAID arrays and then manage and monitor the RAID arrays, refer to the *X64 Servers Utilities Reference Manual*, 820-1120.

Supported components and their part numbers are subject to change over time. For the most up-to-date list of replaceable components for these servers, see the following URL:

`http://sunsolve.sun.com/handbook_pub/Systems/`

1. Click the name and model of your server.

2. On the product page that opens for the server, click the `Full Components List` for the list of components.

Use the following procedure to replace this component.

1. Observe the LEDs on the faces of the HDDs and identify the defective HDD:

- Middle LED on (amber): The drive is faulty and should be replaced.
- Left LED on (green): The drive is operating properly.

2. Execute the software commands appropriate to the software that you are using to prepare the hard drive for removal.

Caution – Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shut down.

The Sun Blade X6220 server module HDDs are hot-swappable, so you can remove an HDD either when the server module is installed in the chassis or when it is out of the chassis. See FIGURE 4-5 and FIGURE 4-6.

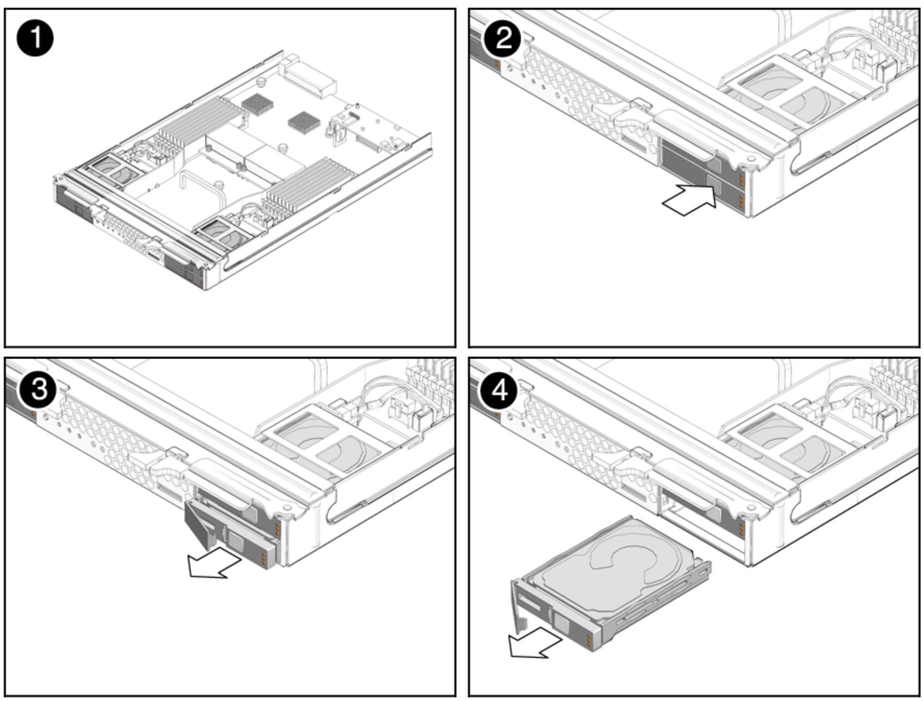


FIGURE 4-5 Removing the Hard Disk Drive After Removing the Server Module

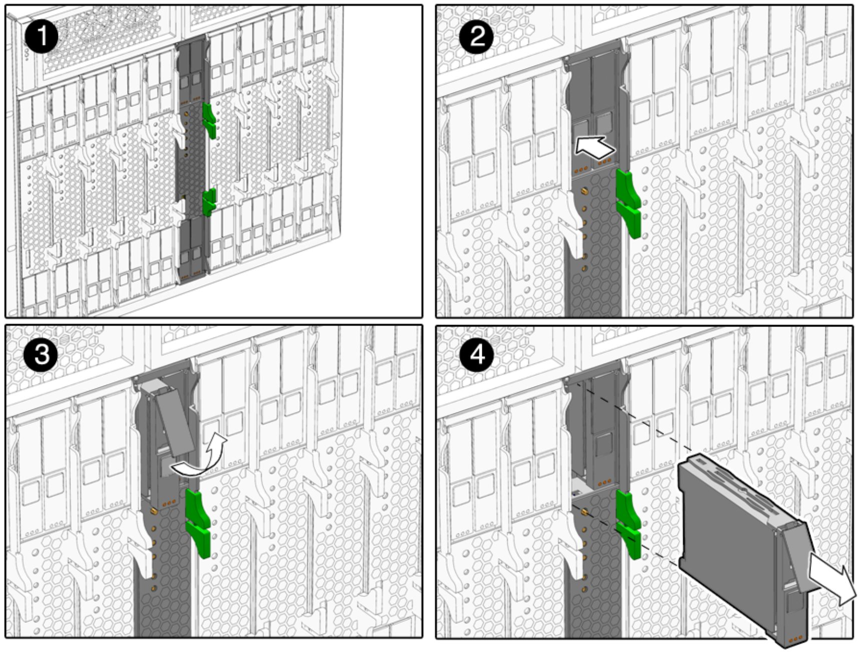


FIGURE 4-6 Removing the Hard Disk Drive Without Removing the Server Module

---

Note – When you return the HDDs in their bays, you must return each HDD to the *same* bay from which it was removed. Use an adhesive note or another method to temporarily label the HDDs when you remove them.

---

3. **Press the button on the face of the HDD to release the spring-loaded securing latch. See FIGURE 4-5 and FIGURE 4-6.**

4. **Grasp the securing latch and remove the HDD from the drive bay.**

   Installation is the reverse of the foregoing procedure.

Note – If the HDDs were previously configured as a mirrored RAID 1 array, an automatic resynchronization is invoked and the contents are automatically rebuilt from the rest of the array with no need to reconfigure the RAID parameters. If the bad HDD was configured as a hotspare, the new HDD is automatically configured as a new hotspare.

Note – When you install an HDD, open its securing latch before you push the drive into the bay. Push the HDD into the bay until it stops, and then close the securing latch to fully engage the connector on the HDD backplane.

4.4.2 Replacing the Battery

Follow these steps to remove and replace the system battery.

Note – This component is a CRU and can be replaced by anyone.

Supported components and their part numbers are subject to change over time. For the most up-to-date list of replaceable components for these servers, visit:

`http://sunsolve.sun.com/handbook_pub/Systems/`

1. Click the name and model of your server.
2. On the product page that opens for the server, click the `Full Components List` for the list of components.

Use the following procedure to replace this component.

1. **Power off the server and remove the server module from the chassis as described in** Section 4.2.1, "Removing the Server Module From the Chassis" on page 4-2**.**

Caution – Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shut down.

2. **Remove the main cover as described in** Section 4.2.2, "Removing the Main Cover" on page 4-4**.**

Note – Before removing the battery from its holder, note the orientation (polarity) of the battery before it is removed. The positive polarity, marked with a "+" symbol, should be facing toward the center of the motherboard.

3. **Remove the battery by gently pulling the clip away from the battery face and lifting the battery straight up. See FIGURE 4-7.**

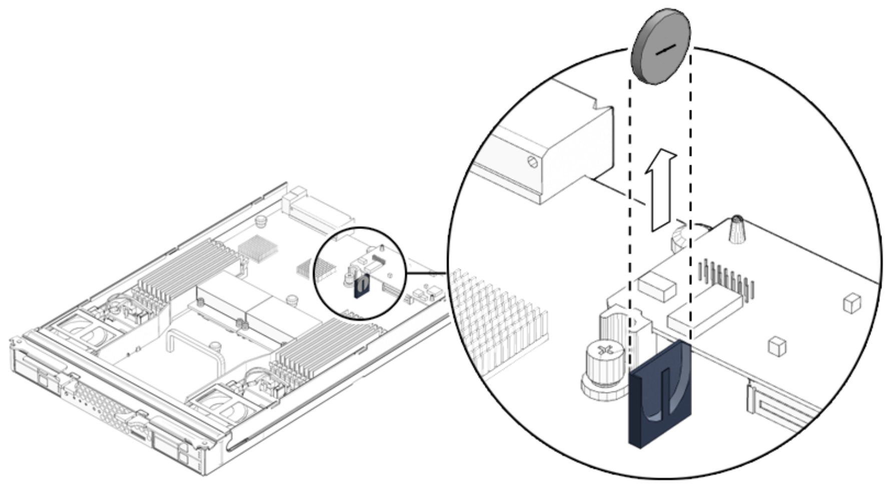


FIGURE 4-7 Removing the Battery

Installation is the reverse of this procedure.

Note – Install the new battery in the holder with the same orientation (polarity) as the battery that you removed. The positive polarity, marked with a "+" symbol, should be facing toward the center of the motherboard.

4.4.3 Replacing the Compact Flash Module

1. **If necessary, back up any data that is contained on the Compact Flash module.**
2. **Power off the server and remove the server module from the chassis as described in Section 4.2.1, "Removing the Server Module From the Chassis" on page 4-2.**

Caution – Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shut down.

---

3. **Remove the main cover as described in Section 4.2.2, "Removing the Main Cover" on page 4-4.**
4. **Locate the Compact Flash module underneath the SP board. See FIGURE 4-8.**

   You do not need to remove the SP board to remove the Compact Flash module.

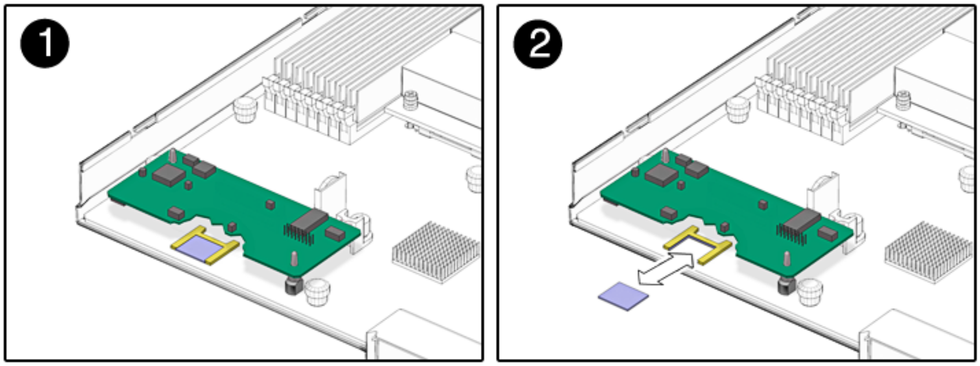


FIGURE 4-8 Replacing the Compact Flash

5. **Grasp the module and pull it out from under the SP board.**

   Installation is the reverse of this procedure.

4.4.4 Replacing Memory Modules (DIMMs)

Use the procedures in this section to remove and replace the server's dual inline memory modules (DIMMs).

4.4.4.1 DIMM Population Rules

The DIMM population rules for the Sun Blade X6220 server modules are listed here:

- Each CPU can support a maximum of eight DDR2 DIMMs.
- Each pair of DIMMs must be identical (same manufacturer, size, and speed).
- The DIMM slots are paired and the DIMMs must be installed in pairs. The memory sockets are colored black or white to indicate which slots are paired by matching colors.
- Populate the DIMMs in the slots farthest from the CPU first. The first pair to be populated should be D7/D6, then D5/D4, and so on.

Note – This component is a CRU and can be replaced by anyone.

Supported components and their part numbers are subject to change over time. For the most up-to-date list of replaceable components for these servers, see the following URL:

`http://sunsolve.sun.com/handbook_pub/Systems/`

1. Click the name and model of your server.
2. On the product page that opens for the server, click the `Full Components List` for the list of components.

4.4.4.2 DIMM Replacement Procedure

Use the following procedure to replace this component.

1. **Power off the server and remove the server module from the chassis as described in** Section 4.2.1, "Removing the Server Module From the Chassis" on page 4-2**.**

Caution – Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shut down.

---

2. **Remove the main cover as described in** Section 4.2.2, "Removing the Main Cover" on page 4-4**.**
3. **Press the fault indicator button on the motherboard to illuminate the LED for the DIMMs that have failed.**

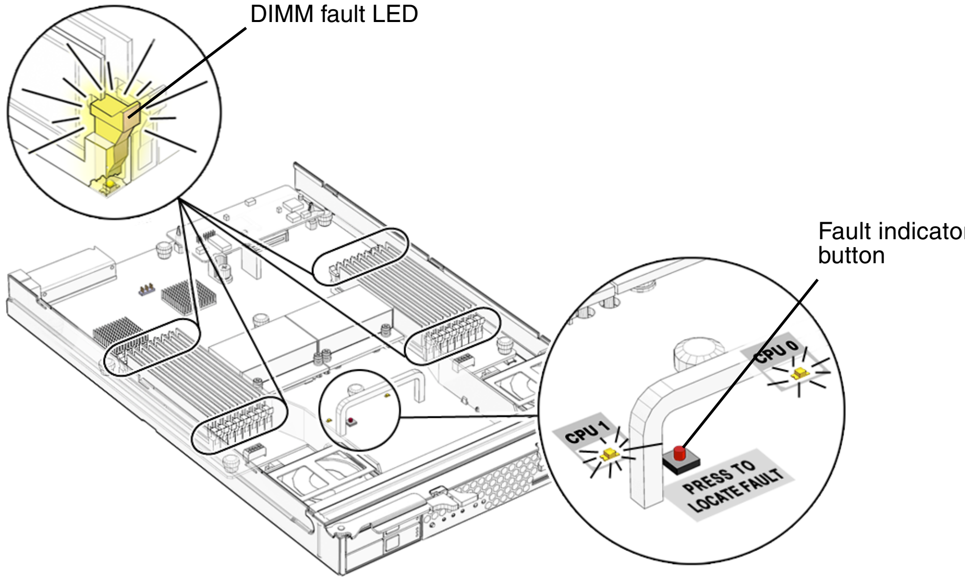


FIGURE 4-9 Fault Indicator Button

4. **Locate the DIMM slot on the motherboard into which you plan to install or replace a DIMM.**

   The DIMM ejector levers contain LEDs that can indicate a faulty DIMM:

   - DIMM ejector LED is off: DIMM is operating properly.
   - DIMM ejector LED is on (amber): DIMM is faulty and should be replaced.

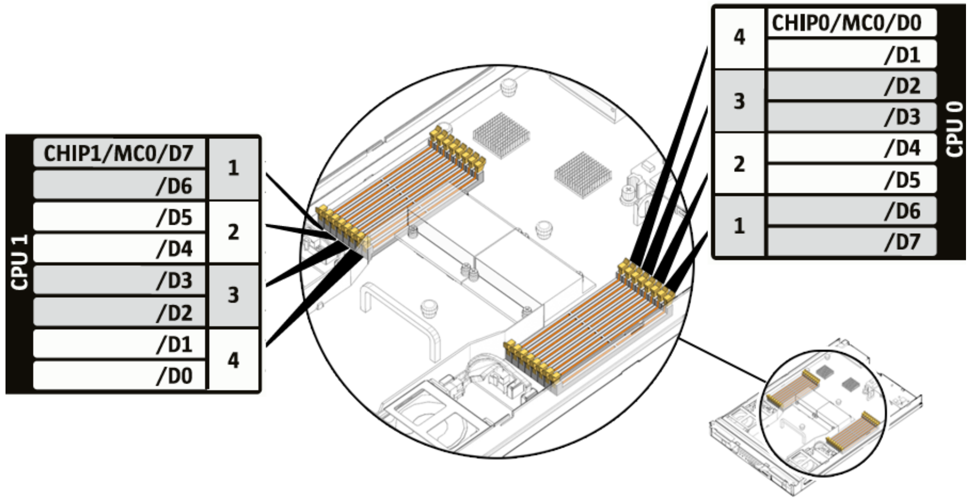


FIGURE 4-10 Sun Blade X6220 Server Module DIMM Slot Numbering and Pairing

5. **Before continuing with the next step, review the guidelines in** Section 4.4.4.1, "DIMM Population Rules" on page 4-12**.**

6. **To remove a DIMM:**

   a. **Rotate both DIMM slot ejectors outward as far as they will go. The DIMM is partially ejected from the socket. See** FIGURE 4-11**.**

   b. **Carefully lift the DIMM straight up to remove it from the socket.**

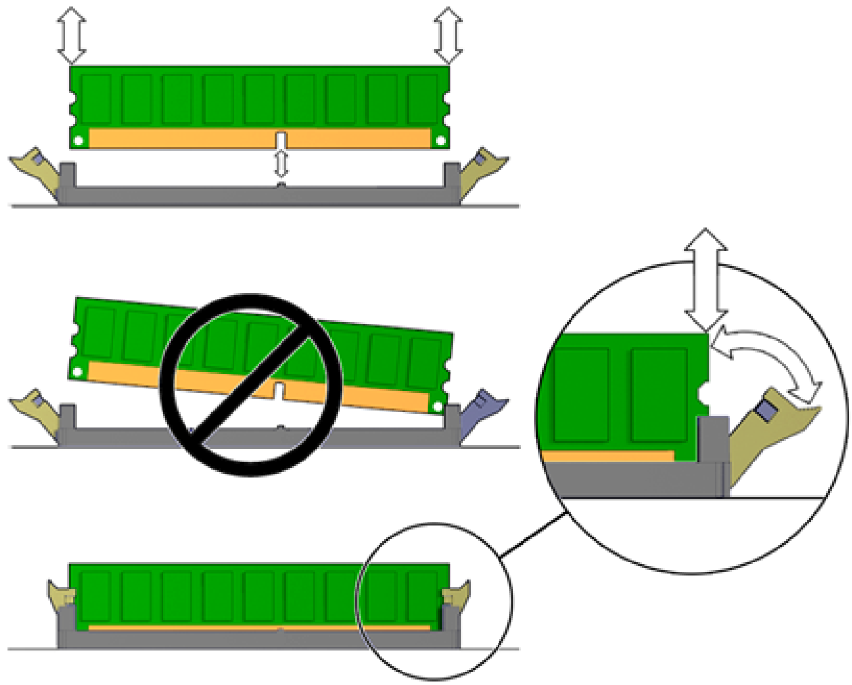


FIGURE 4-11 Removing a DIMM

7. **To install a DIMM:**

   a. **Ensure that the DIMM slot ejectors at each end of the memory socket are fully open (rotated outward) to accept the new DIMM.**

   b. **Align the notch in the bottom edge of the DIMM with the key in the DIMM socket. See FIGURE 4-11.**

   c. **Press down evenly on both top corners of the DIMM until the ejectors snap over the cutouts in the left and right edges of the DIMM.**

4.4.4.3 Error Correction and Parity

The AMD dual-core processor on the Sun Blade X6220 server module provides parity protection on its internal cache memories and error-correcting code (ECC) protection of the data. The system can detect and log to the system event log (SEL) the following types of errors:

- Correctable and uncorrectable memory ECC errors
- Correctable and uncorrectable CPU internal errors
- Faults in the chassis shared infrastructure, including fan and power supply faults

Advanced ECC corrects up to 4 bits in error on nibble boundaries, as long as they are all in the same DRAM. If a DRAM fails, the DIMM continues to function.

Refer to the *Integrated Lights Out Manager Administration Guide for ILOM 1.1.1*, 820-0280, for more information on accessing the error log.

4.4.5 Replacing the SP Board

The service processor (SP) board is sometimes referred to as the graphics redirect and service processor (GRASP) board.

Note – This component is a CRU and can be replaced by anyone.

---

1. **Power off the server as described in** Section 4.2.1, "Removing the Server Module From the Chassis" on page 4-2**.**
2. **Remove the server module from the chassis as described in** Section 4.2.1, "Removing the Server Module From the Chassis" on page 4-2**.**

Caution – Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shut down.

---

3. **Remove the main cover as described in** Section 4.2.2, "Removing the Main Cover" on page 4-4**.**

FIGURE 4-12 shows how to remove the SP card.

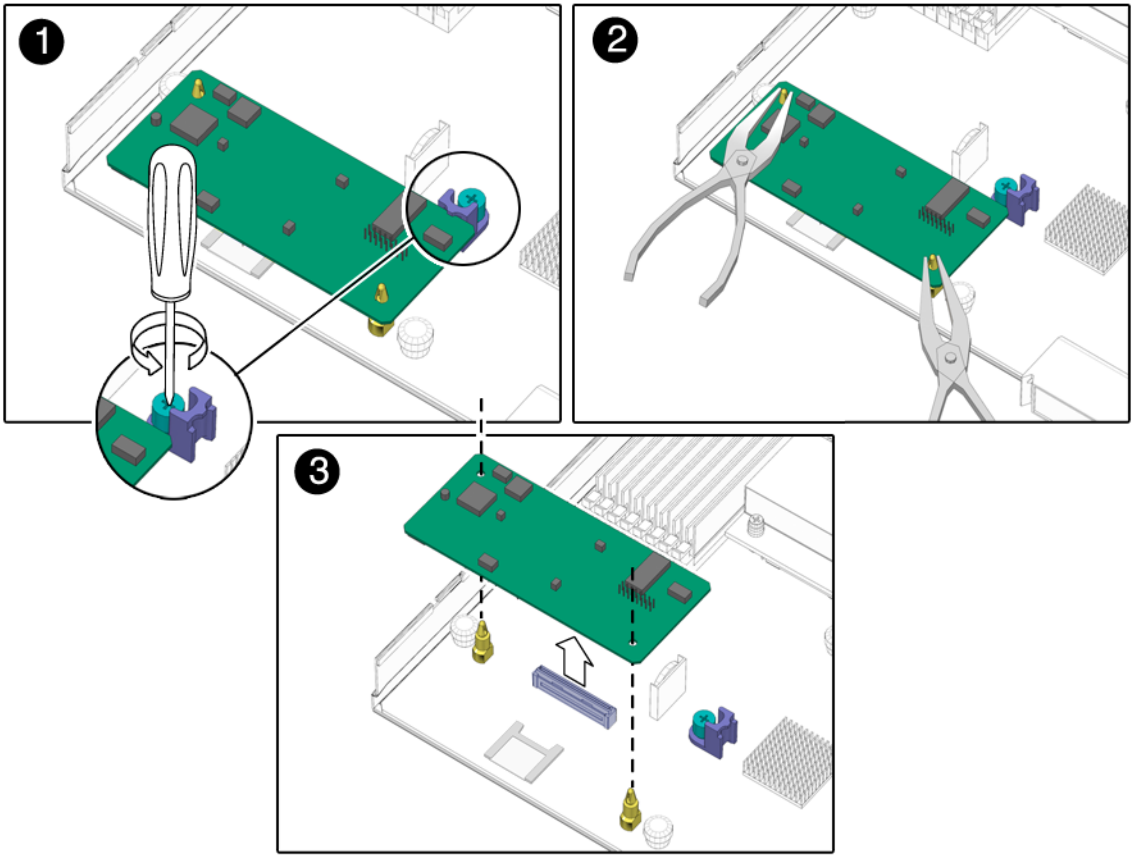


FIGURE 4-12 Removing the SP Board

4. **Unfasten the screw securing the SP board retainer.**

5. **Squeeze the plastic standoff that protrudes through the SP board to press the standoff's locking tabs.**

   If you have difficulty pressing the locking tabs with your fingers, you can use a pair of long-nosed pliers.

6. **Raise the SP board until it is clear of the locking tabs.**

7. **Pivot the front edge of the SP board upward to disengage its connector from the motherboard.**

   Installation is the reverse of this procedure.

4.4.6 Replacing a CPU and Heatsink

Follow these steps to remove and replace a CPU and its heatsink in a Sun Blade X6220 server module.

Note – This component is a FRU and should be replaced *only* by qualified service technicians. Contact your Sun service representative for assistance.

Supported components and their part numbers are subject to change over time. For the most up-to-date list of replaceable components for these servers, see the following URL:

`http://sunsolve.sun.com/handbook_pub/Systems/`

1. Click the name and model of your server.
2. On the product page that opens for the server, click `Full Components List` for the list of components.

Use the following procedure to replace this component.

1. **Power off the server and remove the server module from the chassis as described in** Section 4.2.1, "Removing the Server Module From the Chassis" on page 4-2**.**

Caution – Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shut down.

---

2. **Remove the main cover as described in** Section 4.2.2, "Removing the Main Cover" on page 4-4**.**

3. **Press the fault indicator button on the motherboard to illuminate the LED for the CPU that has failed.**

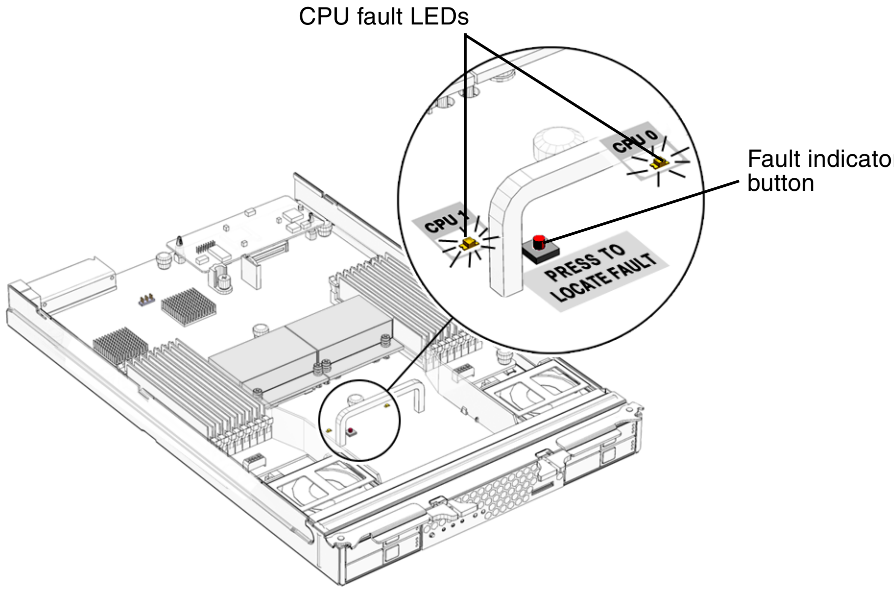


FIGURE 4-13 Fault Indicator Button

4. **Identify which CPU and heatsink you are replacing.**

   The internal designation of the two CPUs in the server is shown in FIGURE 4-13. There is a fault LED on the motherboard for each CPU:

   - LED is off: CPU is OK.
   - LED is lit (amber): CPU has encountered a voltage or heat error condition.

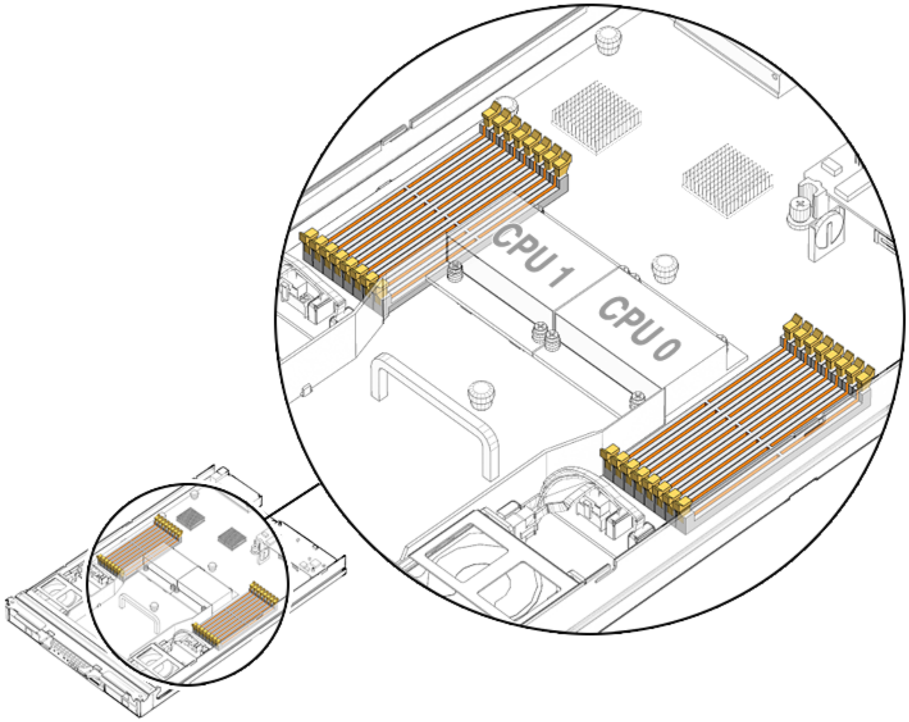


FIGURE 4-14 CPU Locations

5. **Remove the CPU and heatsink from the motherboard:**

   a. **Hold down on the top of the heatsink to prevent it from tipping unevenly while you alternately loosen the four spring-loaded mounting screws that secure the heatsink to the motherboard.**

      Turn the screws 180 degrees at a time, and then remove the screws when they are detached. See FIGURE 4-15.

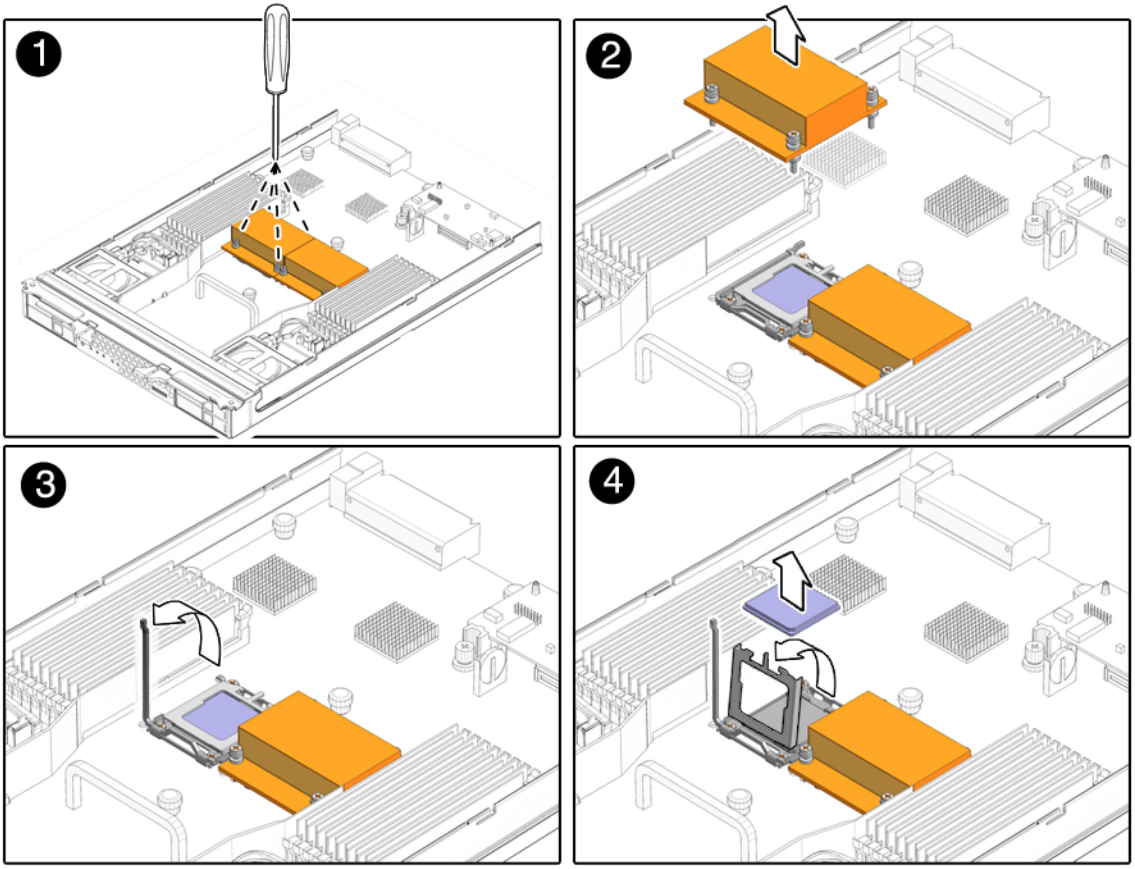


FIGURE 4-15 Removing the Heatsink and CPU

b. **Twist the heatsink slightly to lift it off the board. Turn the heatsink upside down and allow the spring in each of the four mounting holes to fall out into your hand.**

Note – Set the heatsink upside down on a clean, flat surface to prevent the thermal grease from contaminating other components.

---

6. **Pull the CPU socket lever slightly away from the socket.**

   a. **Pivot the lever up, into the fully open position.**

   b. **Open the hinged plate that covers the CPU until it is in the fully open position.**

c. **Lift the CPU out of the socket, leaving the lever and plate in the open position.**

7. **Install the new CPU, or reinstall the existing CPU.**

FIGURE 4-16 shows how to install the CPU and heatsink.

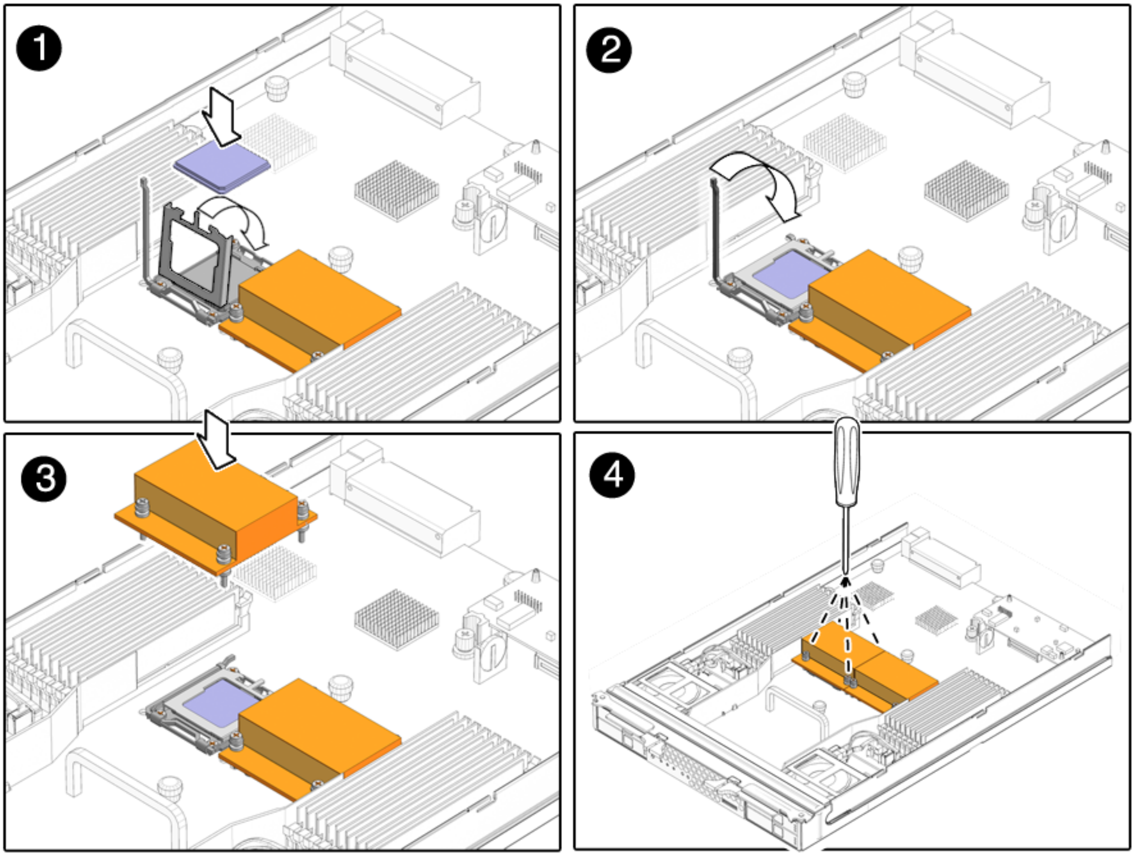


FIGURE 4-16 Installing the Heatsink and CPU

Note – Mixing CPU speeds is not supported. Use two identical CPUs in your server.

---

a. **If you are reinstalling the existing CPU, use an alcohol pad to clean all the old thermal grease from the component surface.**

You will need to apply new thermal grease when you reinstall the heat sink in Step 8.

b. Ensure that the CPU socket release lever and retainer plate are in the fully open position.

c. Align the CPU in the socket.

Note – Use the alignment keys in the CPU socket to match the alignment notches on the sides of the CPU.

---

d. Gently set the CPU onto the pins in the socket.

e. When the CPU is fully seated in the socket, pivot the hinged retainer plate down onto the top of the CPU.

f. Pivot the release lever down and into the locked position, at the side of the socket.

The release lever must lock down the retainer plate as you close the lever.

8. **Install the heat sink:**

a. Using one syringe of thermal grease (0.2 ml/0.5 g), carefully apply grease to the top of the CPU in three lines in the pattern shown in FIGURE 4-17**.**

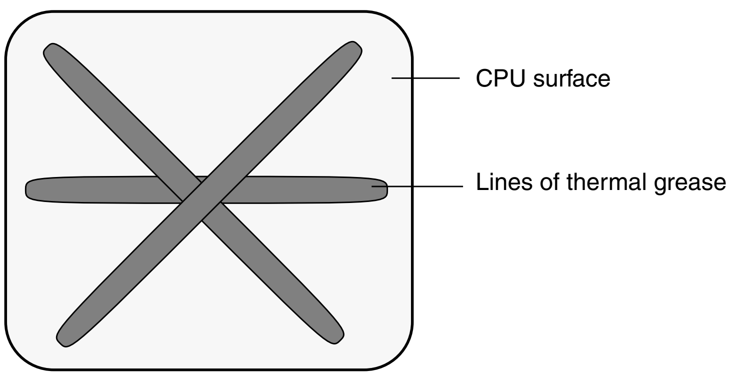


FIGURE 4-17 Required Pattern for Thermal Grease Application

b. If you are reinstalling an existing heatsink, use an alcohol pad to clean all the old thermal grease from the component surface. Also, clean the dust from the heatsink fins.

Note – System cooling might be affected by dust and contaminant build-up. Therefore, you should open and check systems approximately every six months (or more often in dirty operating environments). Check system heatsinks, fans, and air openings. If necessary, clean systems by carefully brushing, blowing, or vacuuming contaminants from the system.

c. **Turn the heatsink upright and reinsert the four springs and mounting screws.**

Caution – Avoid moving the heatsink after it has contacted the top of the CPU. Too much movement could disturb the layer of thermal grease, leading to component damage.

d. **Carefully position and align the heatsink over the CPU.**

Note – The heatsink is not symmetrical, and it must be aligned before you place it on the CPU. Note that the half of the Sun Microsystems logo imprinted on the top of the heatsink creates a complete logo when correctly aligned with the adjacent heatsink.

e. **Lower the heatsink onto the CPU, aligning the mounting screws with their holes on the motherboard.**

f. **Using an adjustable torque driver, alternately tighten the two heatsink mounting screws, 180 degrees at a time, until each spring is completely compressed.**

   Tighten the screws to 7 in.-lbs (0.8 Nm).

4.4.7 Replacing the Motherboard

Follow these steps to remove and replace the motherboard.

Note – This component is a FRU and should be replaced *only* by qualified service technicians. Contact your Sun Service representative for assistance.

Supported components and their part numbers are subject to change over time. For the most up-to-date list of replaceable components for these servers, visit:

http://sunsolve.sun.com/handbook_pub/Systems/

1. Click the name and model of your server.

2. On the product page that opens for the server, click `Full Components List` for the list of components.

Use the following procedure to replace this component:

1. **Remove the server module from the chassis as described in** Section 4.2.1, "Removing the Server Module From the Chassis" on page 4-2**.**

Caution – Do not operate the system with empty slots. Always insert a filler into an empty slot to reduce the possibility of module shut down.

---

2. **Remove the main cover as described in** Section 4.2.2, "Removing the Main Cover" on page 4-4**.**

3. **Remove the following components from the motherboard and place them on an antistatic surface.**
   - DIMMs: See Section 4.4.4, "Replacing Memory Modules (DIMMs)" on page 4-12.
   - CPU and heatsink: See Section 4.4.6, "Replacing a CPU and Heatsink" on page 4-19.
   - Hard drives: See Section 4.4.1, "Replacing a Hard Disk Drive" on page 4-6.

     You must return each HDD to the bay from which it was removed. Use an adhesive note or another method to temporarily label the HDDs after you remove them.
   - SP board: See Section 4.4.5, "Replacing the SP Board" on page 4-17.

Note – The server module enclosure, the motherboard, and hard drive backplanes are all part of the motherboard FRU.

Installation is the reverse of this procedure.

4.5 Servicetool FRU Update Procedure

Caution – The SunService account is for the use of Sun service representatives only. Do not use the SunService account unless you are instructed to do so in a procedure developed by Sun Microsystems.

---

1. **Use the** `ssh` **command to log in to the SunService account. The default password is** `changeme`**.**

   `#` **`ssh`** *<SP IP address>* **`-l sunservice`**

   `#` *<SP IP Address>*`'s password:` **`changeme`**

2. **At the prompt, enter the** `servicetool` **command with options. The options are defined in the following table.**

   `#` **`servicetool --fru_update=serviceprocessor`** *<OtherOptions>=<value>*

Other Options	Value
--fru_product_part_number	Write a new part number to the FRU.
--fru_product_serial_number	Write a new serial number to the FRU.
--fru_asset_tag	Write a new asset tag to the FRU.

3. **Watch the output from the command and respond to the confirmation prompts for continuing the update and rebooting the server:**

```
Servicetool is going to collect system information for the service
processor for future part swaps.

The following preconditions must be true for this to work:

    * The new service processor must be installed.

Do you want to continue (y|n)? y

Service processor FRU information ready to be collected.

You MUST reboot the service processor for to complete

this process. Allow the service processor to fully boot.

DO NOT UNPLUG THE SYSTEM WHILE THE SERVICE PROCESSOR IS BOOTING!

Would you like to reboot the service processor now (y|n)? y

The system is going down NOW!!

Sending SIGTERM to all processes.
```

APPENDIX **A**

System Specifications

This appendix contains physical specifications for the Sun Blade X6220 server module. Refer to the chassis documentation for additional server module specifications.

TABLE A-1 Sun Blade X6220 Server Module Physical Specifications

Specification	Value
Width	12.87 inches (327 mm)
Height	1.7 inches (44 mm)
Depth	20.16 inches (512 mm)
Weight	17 pounds (8 kg)

APPENDIX **B**

BIOS POST Codes

The following topics are included in this appendix:

B.1 POST Codes

TABLE B-1 contains descriptions of all of the POST codes, which are listed in the same order in which they are generated. These POST codes appear as a four-digit string that is a combination of two-digit output from primary I/O port 80 and two-digit output from secondary I/O port 81. In the POST codes listed in TABLE B-1, the first two digits are from port 81 and the last two digits are from port 80.

TABLE B-1 POST Codes

Post Code	Description
00d0	Coming out of POR, PCI configuration space initialization.
00d1	Keyboard controller BAT, Waking up from PM, Saving power-on CPUID in scratch CMOS.
00d2	Disable cache, full memory sizing, and verify that flat mode is enabled.
00d3	Memory detections and sizing in boot block, cache disabled, IO APIC enabled.
01d4	Test base 512 KB memory. Adjust policies and cache first 8 MB.
01d5	Boot block code is copied from ROM to lower RAM. BIOS is now executing out of RAM.
01d6	Key sequence and OEM specific method is checked to determine if BIOS recovery is forced. If next code is E0, BIOS recovery is being executed. Main BIOS checksum is tested.
01d7	Restoring CPUID; moving boot block-runtime interface module to RAM; determine whether to execute serial flash.

TABLE B-1 POST Codes *(Continued)*

Post Code	Description
01d8	Decompressing runtime module into RAM. Storing CPUID information in memory.
01d9	Copying main BIOS into memory.
01da	Giving control to BIOS POST.
0004	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. If the CMOS checksum is bad, update CMOS with power-on default values.
00c2	Set up boot strap processor for POST. This includes frequency calculation, loading BSP microcode, and applying user requested value for GART Error Reporting setup question.
00c3	Errata workarounds applied to the BSP (#78 & #110).
00c6	Re-enable cache for boot strap processor, and apply workarounds in the BSP for errata #106, #107, #69, and #63 if appropriate.
00c7	HT sets link frequencies and widths to their final values.
000a	Initializing the 8042 compatible Keyboard Controller.
000c	Detecting the presence of Keyboard in KBC port.
000e	Testing and initialization of different input devices. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1.
8600	Preparing CPU for booting to OS by copying all of the context of the BSP to all application processors present. NOTE: APs are left in the CLI HLT state.
de00	Preparing CPU for booting to OS by copying all of the context of the BSP to all application processors present. NOTE: APs are left in the CLI HLT state.
8613	Initialize PM regs and PM PCI regs at Early-POST. Initialize multi- host bridge, if system supports it. Setup ECC options before memory clearing. Enable PCI-X clock lines in the 8131.
0024	Decompress and initialize any platform- specific BIOS modules.
862a	BBS ROM initialization.
002a	Generic Device Initialization Manager (DIM) - Disable all devices.
042a	ISA PnP devices - Disable all devices.
052a	PCI devices - Disable all devices.
122a	ISA devices - Static device initialization.
152a	PCI devices - Static device initialization.
252a	PCI devices - Output device initialization.
202c	Initializing different devices. Detecting and initializing the video adapter installed in the systems that have optional ROMs.
002e	Initializing all the output devices.
0033	Initializing the silent boot module. Set the window for displaying text information.

TABLE B-1 POST Codes *(Continued)*

Post Code	Description
0037	Displaying sign-on message, CPU information, setup key message, and any OEM-specific information.
4538	PCI devices - IPL device initialization.
5538	PCI devices - General device initialization.
8600	Preparing CPU for booting to OS by copying all of the context of the BSP to all application processors present. NOTE: APs are left in the CLI HLT state.

B.2 POST Code Checkpoints

The POST code checkpoints are the largest set of checkpoints during the BIOS preboot process. TABLE B-2 describes the checkpoints that might occur during the POST portion of the BIOS. These two-digit checkpoints are the output from primary I/O port 80.

TABLE B-2 POST Code Checkpoints

Post Code	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. At this point, only ROM accesses are to the GPNV. If BB size is 64K, require to turn on ROM Decode below FFFF0000h. It should allow USB to run in E000 segment. The HT must program the NB-specific initialization, and OEM specific initialization can program it if necessary at beginning of BIOS POST, like overriding the default values of Kernel Variables.
04	Check the CMOS diagnostic byte to determine if battery power is OK and the CMOS checksum is OK. Verify that CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system.
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to POSTINT1ChHandlerBlock.
C0	Early CPU Init Start--Disable Cache--Init Local APIC.
C1	Set up boot strap processor information.
C2	Set up boot strap processor for POST. This includes frequency calculation, loading BSP microcode, and applying user- requested value for GART Error Reporting setup question.
C3	Errata workarounds applied to the BSP (#78 and #110).

TABLE B-2 POST Code Checkpoints *(Continued)*

Post Code	Description
C5	Enumerate and set up application processors. This includes microcode loading, and workarounds for errata (#78, #110, #106, #107, #69, #63).
C6	Re-enables cache for boot strap processor, and apply workarounds in the BSP for errata #106, #107, #69, and #63 if appropriate. In case of mixed CPU steppings, errors are sought and logged, and an appropriate frequency for all CPUs is found and applied. NOTE: APs are left in the CLI HLT state.
C7	The HT sets link frequencies and widths to their final values. This routine is called after CPU frequency has been calculated to prevent bad programming.
0A	Initializes the 8042 compatible Keyboard Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different input devices. Also, update the kernel variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Decompress all available language, BIOS logo, and Silent logo modules.
13	Initialize PM regs and PM PCI regs at Early-POST. Initialize multi- host bridge, if the system supports it. Set up ECC options before memory clearing. REDIRECTION causes corrected data to be written to RAM immediately. CHIPKILL provides 4-bit error det/corr of x4 type memory. Enable PCI-X clock lines in the 8131.
20	Relocates all the CPUs to a unique SMBASE address. The BSP will be set to have its entry point at A000:0. If fewer than 5 CPU sockets are present on a board, subsequent CPUs entry points is separated by 8000h bytes. If more than 4 CPU sockets are present, entry points are separated by 200h bytes. CPU module is responsible for the relocation of the CPU to correct address. NOTE: APs are left in the INIT state.
24	Decompresses and initializes any platform-specific BIOS modules.
30	Initializes System Management Interrupt.
2A	Initializes different devices through DIM.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocates memory for ADM module and decompresses it. Gives control to ADM module for initialization. Initializes language and font modules for ADM. Activates ADM module.
33	Initializes the silent boot module. Sets the window for displaying text information.
37	Displays sign-on message, CPU information, setup key message, and any OEM-specific information.
38	Initializes different devices through DIM.
39	Initializes DMAC-1 and DMAC-2.

TABLE B-2 POST Code Checkpoints *(Continued)*

Post Code	Description
3A	Initializes RTC date/time.
3B	Test for total memory installed in the system. Also, check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	By this point, RAM read/write test is completed. Program memory holes or handle any adjustments needed in RAM size with respect to NB. Test if HT Module found an error in Boot Block and CPU compatibility for MP environment.
40	Detect different devices (parallel ports, serial ports, and coprocessor in CPU, etc.) successfully installed in the system and update the BDA, EBDA, etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user's response to the error.
87	Execute BIOS setup if needed/requested.
8C	After all device initialization is done, program any user selectable parameters relating to NB/SB, such as timing parameters, noncacheable regions and the shadow RAM cacheability, and do any other NB/SB/PCIX/OEM-specific programming needed during Late-POST. Background scrubbing for DRAM, and L1 and L2 caches are set up based on setup questions. Get the DRAM scrub limits from each node. Workaround for erratum #101 applied here.
8D	Build ACPI tables (if ACPI is supported).
8E	Program the peripheral parameters. Enable/Disable NMI as selected.
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.

TABLE B-2 POST Code Checkpoints *(Continued)*

Post Code	Description
A7	Displays the system configuration screen if enabled. Initializes the CPUs before boot, which includes the programming of the MTRRs.
A8	Prepare CPU for OS boot, including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	Any kind of chipsets (NB/SB) specific programming needed during End-POST, just before giving control to runtime code booting to OS. Program the system BIOS (0F0000h shadow RAM) cacheability. Port to handle any OEM specific programming needed during End-POST. Copy OEM-specific data from POST_DSEG to RUN_CSEG.
B1	Save system context for ACPI.
00	Prepares CPU for booting to OS by copying all of the context of the BSP to all application processors present. NOTE: APs are left in the CLIHLT state.
61-70	OEM POST error. This range is reserved for chipset vendors and system manufacturers. The error associated with this value may be different from one platform to the next.

APPENDIX **C**

Connector Pinouts

This appendix contains information about the following connector pinouts:

C.1 Front I/O Dongle

The front I/O dongle connector pins and their corresponding descriptions are shown in the figure and table in this section.

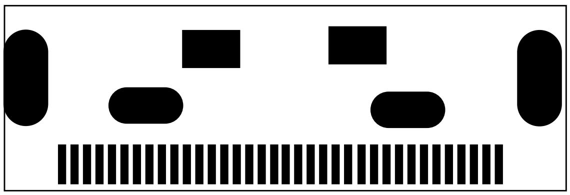


FIGURE C-1 Front I/O Dongle Connector

TABLE C-1 Front I/O Dongle Pins

Signal Name	Pin #	Pin #	Signal Name
No Connect	1, 21, 28, 30, 31, 33, 34	15	USB0_FRONT_VCC
DNGL_VGA_RED	2	16	USB1_FRONT_VCC
DNGL_VGA_GRN	3	17	USB1_FRONT_VCC
DNGL_VGA_BLU	4	18	USB1_FRONT_CM_N
GND	5	19	USB1_FRONT_CM_P
DNGL_VGA_MONID2	6	20	GND
GND	7, 11, 20, 29, 32, 36	22	DNGL_RES_SER_RXD
DNGL_VGA_MONID1	8	23	RES_DNGL_SER_RTS_N
DNGL_VGA_HSYNC_BUF	9	24	RES_DNGL_SER_TXD
DNGL_VGA_VSYNC_BUF	10	25	DNGL_RES_SER_CTS_N
GND	11	26	RES_DNGL_SER_DTR_N
USB0_FRONT_CM_N	12	27	DNGL_RES_SER_DCD_N
USB0_FRONT_CM_P	13	35	DONGLE_PRSNT_L
USB0_FRONT_VCC	14		

C.2 SAS Connectors

The Serial Attached SCSI (SAS) connector pins and their corresponding descriptions are shown in the figure and table in this section.

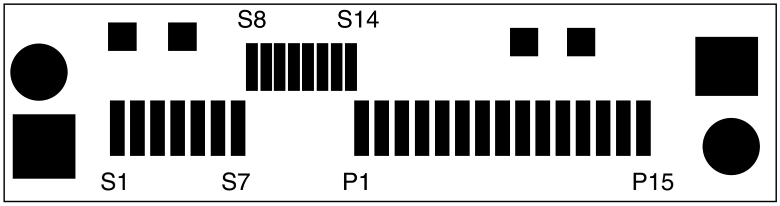


FIGURE C-2 SAS Connector

TABLE C-2 SAS Connector Pins

Segment	Pin Number	Pin Name	Description
Signal Segment	S1	Gnd S7	Second mate ground
	S2	TX+	Positive side of transmit to hard drive
	S3	TX-	Negative side of transmit to hard drive
	S4	Gnd	Second mate ground
	S5	RX-	Negative side of receive from hard drive
	S6	RX+	Positive side of receive from hard drive
	S7	Gnd	Second mate ground
Backside Signal Segment	S8	Gnd	Second mate ground
	S9		Not used
	S10		Not used
	S11	Gnd	Second mate ground
	S12		Not used
	S13		Not used
	S14	Gnd	Second mate ground

TABLE C-2 SAS Connector Pins *(Continued)*

Segment	Pin Number	Pin Name	Description
Power Segment	P1	3.3 V	Not used
	P2	3.3 V	Not used
	P3	3.3 V	Not used
	P4	Gnd	First mate ground
	P5	Gnd	Second mate ground
	P6	Gnd	Second mate ground
	P7	5.0 V	Pre-charge, second mate
	P8	5.0 V	
	P9	5.0 V	
	P10	Gnd	Second mate ground
	P11	Reserved	Should be grounded
	P12	Gnd	First mate ground
	P13	12.0 V	Pre-charge, second mate
	P14	12.0 V	
	P15	12.0 V	

C.3 Service Processor Module

The service processor module connector pins and their corresponding descriptions are shown in the figure and table in this section.

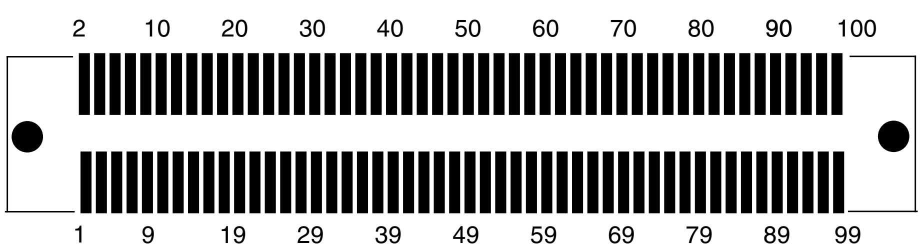


FIGURE C-3 Service Processor Module Connector

TABLE C-3 Service Processor Module Connector Pins

Signal Name	Pin #	Pin #	Signal Name
V33Aux	1	2	GND
GPIOS1	3	4	SP_I2C_CLK
GPIOS0	5	6	SP_I2C_DAT
HOST_LPC_RESET_L	7	8	V3_3AUX
PPC_WANTS_LPC_L	9	10	SP_TDI
GND	11	12	SP_TDO
PS3_POWEROK	13	14	SP_TCK
PS2_POWEROK	15	16	SP_TMS
PS1_POWEROK	17	18	SP_TRST_L
PS0_POWEROK	19	20	GND
GND	21	22	ALL_POWERGOOD
PCI_MFG_SCAN_L (for Sparc)	23	24	TOGGLE_POWER
AFT_MODE_L (for Sparc)	25	26	SP_SCAN_ENABLE_L
V5V	27	28	SP_OK
LPC_LAD3	29	30	SYS_HEARTBEAT
LPC_LAD2	31	32	GND
LPC_LAD1	33	34	LPC_SER_IRQ
LPC_LAD0	35	36	SERIAL_CNTL
LPC_FRAME_L	37	38	PROC_I2C_DISABLE
GND	39	40	NMI_DUMP_L
LPC_CLK	41	42	LOCATE_L
GND	43	44	SYS_SP_RESET_L
V33AUX	45	46	V3_3
USB2_P	47	48	SP_FORCE_OFF
USB2_N	49	50	SP_PWR_ON_RESET_L
GND	51	52	SP_INSTALLED_L
USB1_P	53	54	SP_LDSTOP_L
USB1_N	55	56	BASE_SP_BUTTON

TABLE C-3 Service Processor Module Connector Pins *(Continued)*

Signal Name	Pin #	Pin #	Signal Name
GND	57	58	GND
USB0_P	59	60	PPC_TX3
USB0_N	61	62	PPC_RX3
GND	63	64	V33AUX
DVI_RX0_P	65	66	SOL_RXD
DVI_RX0_N	67	68	SOL_TXD
GND	69	70	SOL_CTS_L
DVI_RX1_P	71	72	SOL_DCD_L
DVI_RX1_N	73	74	SOL_DTR_L
GND	75	76	SOL_RTS_L
DVI_RX2_P	77	78	GND
DVI_RX2_N	79	80	PPC_RXD
GND	81	82	PPC_TXD
DVI_RXC_P	83	84	PPC_CTS_L
DVI_RXC_N	85	86	PPC_DCD_L
GND	87	88	PPC_DTR_L
ETH_RX_P	89	90	PPC_RTS_L
ETH_RX_N	91	92	GND
GND	93	94	Eth_Rx_Act
ETH_TX_P	95	96	Eth_Link_1000
ETH_TX_N	97	98	Eth_Link_100
GND	99	100	V33AUX

C.4 SAS Diskplane

The SAS diskplane connector pins and their corresponding descriptions are shown in the figures and tables in this section.

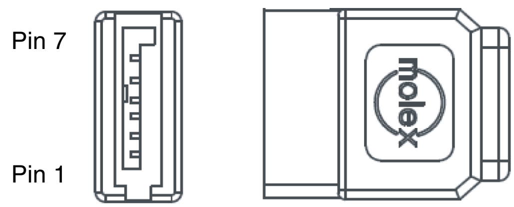


FIGURE C-4 SAS Diskplane Signal Connector

TABLE C-4 SAS Disk Backplane Signal Connector Pins

Pin Number	Signal Name
1, 4, 7	GND
2, 3	TX+/TX-
5, 6	RX+/RX-

C.5 SAS Power/LED Connector

The SAS power/LED connector pins and their corresponding descriptions are shown in the figures and tables in this section.

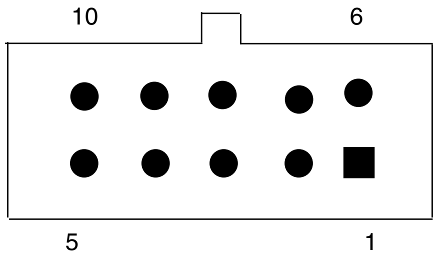


FIGURE C-5 SAS Power/LED Connector

TABLE C-5 SAS Power/LED Connector Pins

Pin Number	Signal Name
1	DISK1_FAULT_LED_N
2	DISK1_RDY2RM_N
3	DISK1_ACT_LED_N
4	12V
5	GND
6	DISK0_FAULT_LED_N
7	DISK0_RDY2RM_N
8	DISK0_ACT_LED_N
9	5V
10	GND

C.6 Compact Flash

The Compact Flash connector pins and their corresponding descriptions are shown in the figures and tables in this section.

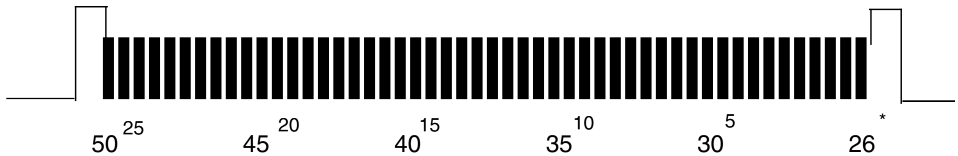


FIGURE C-6 Compact Flash Connector

TABLE C-6 Compact Flash Connector Pins

Signal Name	Pin #	Pin #	Signal Name
GND	1	26	PRSNT_N
D03	2	27	D11
D04	3	28	D12
D05	4	29	D13
D06	5	30	D14
D07	6	31	D15
CS1_L	7	32	CS3_L
GND	8	33	No Connect
ATA_SEL	9	34	IOR_L
GND	10	35	IOW_L
GND	11	36	WE
GND	12	37	INT_L
3.3V	13	38	3.3V
GND	14	39	IDE_CSEL
GND	15	40	No Connect
GND	16	41	IDE_RESET_L
GND	17	42	IDE_RDY

TABLE C-6 Compact Flash Connector Pins *(Continued)*

Signal Name	Pin #	Pin #	Signal Name
ADDR2	18	43	DRQ_L
ADDR1	19	44	DACK_L
ADDR0	20	45	No Connect
D00	21	46	No Connect
D01	22	47	D08
D02	23	48	D09
No Connect	24	47	D10
IDE_CD2	15	50	GND

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